SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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NEW MEXICO.

THE NACIMIENTO COPPER COMPANY OF NEW MEXICO.—The following is an extract from a letter written by Dr. Peters, jun., mining engineer, directed to the owners of Eastern Copper Smelting Works, for whom Dr. Peters, jun., mining engineer, was employed as superintendent of their works, and by whom he was sent to New Mexico for the purpose of examining the Nacimiento copper ore deposit:—

I returned from the Nacimiento Mine last night . . . For geology, climate, and general surroundings see Cazin's pamphlet,* which is strictly correct as far as my observation goes . . . No one can look at a wall of sandstone, covering a number of square miles, and filled with petrifacts of copper glance, often altered into red oxide and malachite and azurite, and again only stained, and form any estimate of what profits can be obtained by mining it. At the first claim I visited I could scarcely see anything, and yet in 15 minutes grubbing with a pick I unearthed what I estimated to be equal to 12 lbs. of metallic copper. My impression is that the petrifacts will pay largely, owing to the wonderful facility with which the rock blasts (one 10 ft. hole ought to throw down 50 tons), and the ease with which it breaks up and separates from the petrifacts, I think three good quarrymen could keep 30 or 40 men picking the ore, breaking up sandstone fragments, and tramming the waste rock over the dump, for which latter there is ample room and fall. But I attach much importance to the lower grade of carbonate ores, which exist in far larger quantities, and consist of sandstone streaks, crusts surrounding each petrifact, and isolated masses running from half carbonate of copper down to a mere stain. Only steady work for a given length of time, with careful data as to production, can determine how absolutely profitable these mines can be made. My impression is that the profits would be enormous. All the claims I have visited (five or six) presented the same characteristics. I think with two men I could pick up several hundred (or thousand) dollars worth of loose petrifacts on the first claim I visited, which lie embedded in the soil and debris covering the sandstone, this layer being from a few inches to several feet deep. I think the size and thickness of this sandstone layer is correctly given in Cazin's report.

For an area of 20 or 30 square miles the country seems covered here and there with petrifacts of copper glance; I never saw so much rich copper ore before. From what I can see or hear there is more and better ore of silver, copper, gold, and lead within 60 miles of this town than I have ever seen in all Colorado. Fuel and timbers are very superior in quality and in unlimited quantity; one could saw plenty of timber 16 by 16 and 40 ft. long. This wood is fully equal to anything Hill had at Blackhawk,† and far superior to what I used successfully in reverberatories at Mount Lincoln. I think it would be cut and delivered for $2·50 per cord or less. There is said to be an abundance of oak. Coal occurs almost everywhere in about 2 or 3 ft. veins. One vein crops out almost on the mill site—quality unknown. Probably, from the weathered samples I saw, a free-burning, non-coking, short-flamed, stone coal, suitable for boilers, stoves, and calciners, unsuited for smelting unless mixed with coking coal.

Fluxes, lime-stone, exist in abundance. Heavy beds of hematite and limonite crop out beside the coal at mill site; it can apparently be mined at for less than $1 per ton; it also occurs all over this section of country, apparently very heavy and pure. Gypsum exists in solid hills 100 ft. high, and miles in length. There is the best natural road I ever saw from Nacimiento to Bernalillo railroad station. It is about 50 to 55 miles; a few hundred dollars spent in bridging some deep ravines, and grading one bad hill will put it in shape for heavy lodes. The road from the mine to the mill site is not long, but will require considerable work—$200, perhaps.

Everyone states that a stream of 50 gals. of water per minute can be depended on in the dryest time. From former experience I should say that Mexican labour would answer for chopping wood, picking, and dressing ores (excellent), driving cattle with copper to Bernalillo (excellent), calcining, &c. American and skilled labour not employed so I cannot quote prices; should guess it at $2·50 for labour, $3·50 for mechanics.

Bernalillo, N. M., Jan. 24. D. E. D. PETERS, jun., Mining Engineer.

We learn that the gentlemen to whom this letter was directed have made an arrangement for erecting and running furnaces at Nacimiento.

The following letter written by our esteemed contributor, Mr. F. M. F. Cazin, M. E., relates to the same ore deposit as the letter of Dr. Peters, jun., M. E., does:—

GENTLEMEN,—Complying with your request of the 24th to submit to your board‡ an abstract of report on the Nacimiento copper ore deposit (published *in extenso* in the Engineering and Mining Journal of August 7 and 14, 1880), now the property of your company, I stated as follows:—

This copper ore deposit consists in a vein of sand rock and conglomerate,§ carrying ores of copper and silver, forming high cliffs, visible from long distances on the west slope of the Nacimiento, or Jemez, mountain range. The ore-bearing stratum is 60 ft. in thickness. The deposit is 42 miles distant and north-west of the railroad station Bernalillo, on the New Mexico and Southern Pacific Railway, which is a prolongation of the Atchison, Topeka, and Santa Fe Railway towards the Republic of Mexico. A good wagon road leads from the said railroad station situate on the east bank of the Rio Grande, over a good wooden bridge, lately constructed, to the immediate vicinity of the ore deposit at its northern end.

The ore-bearing ledge is best accessible at this northern end where it approaches the head (Nacimiento) of the Puerco River, a tributary of the Rio Grande, and the valley. The southern continuation of the Denver, Rio Grande Railway, also now in course of construction in New Mexico, will approach the ore quarries to equal or closer connection than they have at present with the Atchison, Topeka, and Santa Fe Railway. These ore quarries are at an altitude of 7000 ft. above the sea level, and of 2100 ft. above the waters of the Rio Grande at Bernalillo. The surrounding climatic, topographical, and economical circumstances are exceptionally beneficial to the working of these ore quarries. Outdoor labour is practised at Nacimiento all the year round without climatic impediment, and all material comes down hill towards the northern end of the ledge for manipulation.

The ore deposit is surrounded by forests of pinon and pine trees. Stone coal of good quality (short-flamed black coal, in veins of 42 in. of clean coal) is in immediate vicinity of the ore deposit. Native Mexican labour can be had to the full extent of requirement at $1 per day, and the Rio Puerco valley near the quarries can produce all that is required for sustaining a large population. The ore proper occurs in the sand rock as cuprifacts of leaves, stems, leaves, and trunks of trees.|| The ore proper assays 44 per cent. of metallic copper. Large test samples of the ore, as it has been brought to the furnace, assayed 38·63 per cent. of metallic copper, with nothing deleterious in smelting and the product. I estimate the copper contained in the fifteen claims at present fully accessible, because fronting the main longitudinal valley, at 200,000 tons, which at 20c. per pound would represent a value of $80,000,000.

The copper produced from the ore contains ¦829 in silver, which eventually may be utilised by introducing lixiviation. In mere smelting the silver serves only to impart to the copper, when manufactured into wire, a high degree of conductivity (higher than of pure copper), and as a consequence procures to Nacimiento copper a ready sale, and a price being a fraction above quotation of standard ingot

The percentage of the ore proper in the vein (being 60 ft. wide) is a low one, there being by the lowest estimate made by experts 1·25 per cent. of 40 per cent. ore. My own practical tests showed the presence of 4 per cent. in the quarries opened. Notwithstanding this low percentage of ore in the entire rock, the ore required for a ton of copper can be contracted for and delivered at furnaces at less than $100, and can, by the company's own labour, be produced for considerably less. This is caused by the facts that the sand-rock containing the ore (*a*) is exposed on the surface, standing upright on the incline of 40°, and can, in consequence, be quarried in immense quantities at very low cost; no mining proper, as tunnelling or sinking shafts, being required, and the entire exploration work being carried out on the surface; (*b*) is crumbly and soft. By the mere blasting and falling down the slopes it crumbles into small pieces, and the sand entirely falling apart from the dark-coloured and harder ore; (*c*) on blasting lets the ore proper fall separate in such pieces as can readily be picked out on account of their darker colour, while the waste is loaded into the dumping cars.

Thus the ore is produced at the quarries by mere hand picking, with an average of over 38 per cent. of copper. On account of a forest of excellent firewood and several veins of stone-coal being available at Nacimiento, the smelting cost will be as low as anywhere on the Continent. A contract has been made for the construction of furnaces at Nacimiento, and for smelting and refining the copper for less than 5 cents per pound, with three gentlemen actively and successfully engaged in copper mining and smelting, owning and operating large copper smelting works, at Capleton, Canada, and Bergen Point, New Jersey. There can be no doubt but that these three gentlemen will carry out their contract as soon as the quarries are in proper shape to deliver to them the ores at the rate of 6 tons of copper per day, as the contract calls for. A careful estimate, &c., of costs under proper consideration of all facts and of all relative technical experience, resulted in the conclusion that copper can be produced at Nacimiento regularly in quantities depending solely on the capacity of the works at the cost of less than 10 cents per pound, including freight to New York.

On a production of 6 tons of copper per day the probable margin would be $160 per ton, or $960 daily, copper bringing 18 cents per pound.

New York, Feb. 25. F. M. F. CAZIN, Mining Engineer.

* See Engineering and Mining Journal, Aug. 7 and 14, 1880, and editorial of same journal of Sept. 4, 1880, p. 153. The article, "New Mexico v. Lake Superior as a copper producer," was written especially for the Engineering and Mining Journal.

† Prof. Hill, at the Boston and Colorado Smelting Works at Blackhawk, formerly smelting entirely with wood, which gave excellent results for many years.

‡ Of the Nacimiento Copper Company of New York.

§ Called by the natives "La Lista de la Campana" (Church Bell vein), because under Spanish government a church bell was made from its ore.

|| Compare Prof. Newberry's report of 1860 on the same ore deposit and formation. Also in the report of the director of the Mint upon the production of the precious metals in the United States," p. 384, Silver and Copper in Sedimentary Rocks, by C. W. Jackson, member of the California University of Science.

Original Correspondence.

LEAD REPORT.

Sir,—The market for the last two months has been in a most unsatisfactory state, and falling each week, and to effect sales lower prices have to be taken. The demand for red and white lead is very great, and higher prices in proportion to the price of pig lead have been paid than for the last few years, but the demand for pig and sheet lead has been poor. The sales effected this month are rather large and as follows:—

April 13	400 tons	rich Spanish.....	£14 10	0
„ 14	400 „	„ ...	private terms.	
„ 15	145 „	„ ...		
„ 15	400 „	„	£14 5	0
„ 17	400 „	Greek.....	14 5	0
„ 25	430 „	„	14 7	6

Market rather firmer.—*April* 26. STOCKS.

THE TIN TRADE.

Sir,—In September, 1881, I ventured to express an opinion in the columns of the *Mining Journal* that there was no occasion for the alarm which then prevailed as to short supplies of tin, and I now submit that the following figures prove conclusively that the quantities which have arrived since that date are largely in excess of any actual requirements:

Spot and Floating for London.		Holland.		Total.
November 1, 1881..... Tons	8,094	5,485		13,579
December 1, „	8,040	5,619		13,659
January 1, 1882	10,386	5,975		16,361
February 1, „	9,975	5,006		14,981
March 1, „	10,330	5,943		16,273
April 1, „	10,595	6,111		16,706

Facts are stubborn things, and these particulars serve to demonstrate that production is now going on at the rate of 9000 tons per annum in excess of consumption.

In the consideration of these statistics it must not be forgotten that a further large quantity of tin is concealed in Marseilles, Paris, Swansea, and elsewhere, having been sent away to produce the following irregular table of deliveries which tell their own tale to those who follow the matter closely:

Deliveries from London.		Holland.		Total.
November, 1881	1,533	600		2,133
December, 1881	1,049	590		1,639
January, 1882	1,589	475		2,064
February, 1882	955	509		1,464
March, 1882	1,109	500		1,609

In a free country I suppose that no one can dispute the right of Dutch and German Syndicates to cripple our industries, but at all events, as players, we have the right to claim that *all* the cards should be on the table, and that innocent people should not be misled by the glare of false figures which "tend to bewilder and dazzle to blind."—*April* 25. CYMRO.

THE GOLD AND DIAMOND FIELDS OF SOUTH AFRICA.

Sir,—The Diamond News of March 28, in a very able article on our diamond mining companies, says—"Kimberley is drifting towards one of two things—a crisis or financial stagnation—and it is difficult to say which will be the worst." After dilating on the ill effects of the company mania, which they say is the sole cause of the present depression (and they are right), they conclude thus:—"And the worst feature of all in the whole business is that in more than one case companies have been started with fraud, carried on with fraud, and at present exist as frauds. Concerning this last point there should not be one moment's hesitation in the matter; let the shareholders who have any suspicion that the company they are interested in has been promoted in an underhand manner immediately demand an explanation from their directors, and, should this be refused, let a committee of investigation be formed among the shareholders, and the true condition of the property ascertained. The system of patching up an unsound undertaking is in every respect useless, for unless there be a firm foundation sooner or later the company must fall, and all the tinkering in the work will not prevent it. We fear some directors are very slow to learn the lesson that their best policy is to keep none of the particulars of the position of the companies they manage secret from shareholders; but those who adopt such a course of action may be assured that the day is not far distant when all attempts at concealment will be useless. We utter no idle threat when we say that before long the Press will look into the matters, and supply the information to shareholders that it seems now is withheld. The truth must be recognised that the only thing that can save our credit is the general weeding out of the companies which do not give reasonable prospects of success, and towards the working of such an end it is the duty of all who had the interests of the place at heart to co-operate, and if once we can come forward before investors in all parts of the world with the proof that our undertakings are really sound we shall not find that the development of our industry is in any way checked through the want of sufficient capital.

During the past week there have been several attempts at arson, and several insurance companies have very nearly been let in for large amounts. But, thanks to the vigilance of the police, the most diabolical attempts were frustrated, and the half of Kimberly saved from destruction. Some of the incendiaries are in custody, and are likely to get their deserts.

In the Kimberley Mine the reef continues to be as treacherous as ever. The slip from the south-east corner has reached nearly the centre of the mine, and has filled up the reservoirs of the Central Company. The Barnato and South-East Companies are still troubled with reef. The Octahedron Company are washing about 300 loads per day, which ought to give them a small dividend. The French Company are working well. The companies in the Kimberley Mine to be avoided at the present time are—Beaconsfield, capital 132,000*l.*; Cape Diamond Mining Company, capital 330,000*l.*; North-East, capital 65,000*l.*; Vulcan, capital 82,000*l.*; Gem, capital 80,000*l.* The ground in the latter company is generally acknowledged to be the richest in the mine, but for a very long time it has been quite buried with fallen reef, and will be for a long time to come. At Jagersfontein, out of the fourteen companies, representing a capital of about 1,500,000*l.*, there are no signs of a legitimate dividend. At Koffyfontein the whole mine is steadily improving. The ground is not very rich, but the yield of diamonds is regular. At Ottos Kopjie they have washed 100 loads of diamond soil, which, according to report, has produced eight diamonds, worth 50*l.*, or at the rate of 10s. per load. If this be true, it will pay splendidly. At Kamfersdam they are still short of water. It is said their blue diamond soil will yield 20s. per load; but this I very much doubt, and if it will yield from 10s. to 12s. per load it ought to give a good dividend. I believe that, with a good supply of water, this is a payable mine. It is about the same size and shape as the Kimberley Mine, and the 85 carat stone found on the 29th inst. is very encouraging.

At the Old De Beers Mine there is no improvement. There are great hopes entertained that the Erlangers of London and Paris will purchase the whole mine for about three millions sterling. It would certainly be a godsend for this place if they did so, and as they have their own advisers they ought to be in a position to know something of the value of the property. At Bultfontein some of the companies who were working at a serious loss, and were on the point of winding up, started selling their diamond soil to private individuals, the result being that both seller and purchaser are doing fairly well. At Du Toits Pan Mine several of the companies are improving, and, judging from present appearances, this is likely to be the mine of the future.

The electric light is a great acquisition to Kimberley; and every person connected with the Kimberley Waterworks are deserving of the highest praise for the energetic manner in which they are pushing forward this scheme. People here are delighted to learn that our old ally Mankorane has repulsed eight successive attacks made by the Boers on Taungs. The Boer leader was shot while setting fire to a hut. Mankorane's losses were small, but the Boers had a great number wounded. These border wars have a very serious effect on the diamond fields.

In my last I informed you that "the excitement with regard to the gold discoveries in the Transvaal were subsiding," but it has again broken out with renewed vigour, and this time it leaves all the discoveries of Baron Munchausen quite in the shade. A Mr. P——, writing to the Advertiser from the Crocodile River, says:—"There is a reef running from here right into Pilgrims Rest, a distance of at least 50 miles, the whole of which will yield 50 lbs. of gold to the tin dish." He describes the reef as being 10 ft. broad and very soft. This would give, for a depth of only 6 ft., about 1,500,000 tons of the precious metal. It may not surprise your readers to learn that the whole of the above rich discovery is being offered to a friend of mine for 5000*l.* I mention this reported discovery to show what absurd statements are being circulated for the purpose of trying to gull the public, and rush a population into the fever districts of the Transvaal. I have been over this part of the Transvaal, and know that traces of gold can be found almost everywhere, and I shall not be surprised to learn that a few payable patches may be found in the gulleys sufficient to give a few hard-working diggers a few hundreds of pounds; but most of the gold found on the Crocodile River will cost at least 12*l.* per oz. Johnson and party, who left here in November, for the purpose of prospecting for gold on the Crocodile, have not since been heard of. There has been no news from the fever-stricken party at the Tatin since my last. Messrs. James and J. Lininburg are bringing a ton of quartz from six months south of Pretoria to Kimberley. I have no doubt but that many persons will see a large percentage of gold extracted from this lot of quartz. I shall give you the truth respecting it. They are also bringing 15 cwts. of lead ore, the value of which I shall be able to estimate.

There is still great dissatisfaction at Pilgrim's Rest. The diggers say the reason the Boer Government are robbing them of their rights and giving them to Benjamin is because they are Englishmen. The claims of the Brothers Lockhead are turning out fairly well, but the average yield of gold from Pilgrim's Rest has fallen off during the last month. At Waterfall the property belonging to the Messrs. Hampson, White, and Cope is leaving a small profit. I hear they intend to form a good company, and give the place a fair trial. At Mac Mac the place from which some very rich samples were taken in the early part of January turns out to be a mere patch—some 64 ozs. having exhausted the place. It is fortunate for the company who were in treaty for the purchase of this place that they were allowed three months' trial before purchasing. They now retire with a loss of only about 1200*l.*, whereas had they purchased the property without the chance of a trial their loss would in all probability have been from 80,000*l.* to 100,000*l.* At Spitz Kop there is not much doing. Ferguson and party are pushing on their water-course, and when it is complete they are likely to do very well. In fact, there are a few old diggers at each of the diggings who have had their claims for a long time who are making fair wages; but the majority of those who were induced to go to the Lydenburg gold fields, through the false represention of the concessionaires, are returning to this place in a sorry plight. The whole of Spitz Kop ought to be in the hands of one good company, but I expect the owners would want a very large price for it.

Attempts are being made to get up a little excitement at the old Erstling Mine, near Marabastadt; but the late manager, Mr. Polkinghorn, did his very best for the late company, and proved beyond a doubt that as a gold mine Erstling is not worth a farthing. There is a little gold there, of conrse, but only enough to entice the unwary on to their ruin. There has for some time been a report of a rich discovery of silver near Jacobie's, about 50 miles south of Pretoria. A picked sample was brought to me last week for inspection, which turns out to be specular iron. I am particular in referring to those properties that are likely to be introduced into the English market. The Diamond News says:—"Periodically South Africa is attacked with a gold fever; at the present time there are unmistakeable symptoms of the disease. We learn that in many districts of the Transvaal every farmer has turned prospector, and, instead of attending to his natural business, runs wildly about with specimens of gold (?) bearing quartz. The same kind of excitement was got up for the same part of the country in 1868, and a large number of hardy Australian diggers landed in Natal, and proceeded to the supposed gold fields. They found mere traces of gold almost everywhere. After experiencing great hardships they returned to Natal, and were with great difficulty restrained from pulling down the office of the Natal Mercury because they published such misleading statements. It is a thousand pities that one or two really promising concerns cannot be pointed out without being made the means of introducing such a flood of rascality. CORRESPONDENT.

Kimberley, March 30.

INDIAN GOLD MINES, AND THEIR FUTURE.

Sir,—The report of the Wynaad Perseverance Estate and Gold Mining Company's meeting in last week's Journal is interesting in several respects. First, I note Mr. Cooper's statement that such reefs as the Elizabeth show, according to Mr. Claudet's assay, only traces of arsenic, and that even in this case the residue could be sold with profit to a reduction company; and that the refractory pyrites at Bolingbroke will afford still more scope for that reduction company. Secondly, I observe that Mr. Oliver Peglar spoke at the meeting in question; and I should just like him to answer a few questions through the Journal. The point has been raised whether the auriferous quartz exhibited at the offices of the bankruptcy firm of Smith Fleming in London was originally found in India, or was first taken there—say, within the last 10 years, which is a comparatively short period in geological time—so that the expected demand for quartz specimens might be met. I carefully read about a page of the *Mining Journal*, containing Mr. Oliver Peglar's report, with illustrations—I mean before the commencement of the Anglo-Indian gold mania—and I made this abstract of the report in my note book:—"Oliver Pegler, A.R.S.M., has reported on the Indian Gold Fields, see *Mining Journal*. Not permitted to see anything, evidently quite a stranger in the place, came away with some funny pictures, and wrote an encouraging report. Am inclined to turn mining expert myself." No doubt I had at that time a shady opinion of Indian gold mines, and but for having been since enlightened should at present have 1264*l.* 10s. (exclusive of interest) more in my pocket. However it is useless to cry over spilt milk, particularly as the milk all went into three puddles, so that I still hope to skim up some cream.

But what I want to ask Mr. Pegler is whether, although nobody let him see anything, he succeeded, sureptitiously or otherwise, is seeing *in situ* any quartz similar to or in any way resembling that exhibited in connection with his report, and whether he tried old Nich. Ennor's experiment of picking down what he saw (old Nicholas was not an A.R.S.M.), and that "asking for more." If he did so was the "more" forthcoming, or was the result, like Ennor's, the discovery that the ore was enclosed in a gangue of modern mortar—so modern that it did not even contain any cowhair.—I fear that it is now too common a practice to select experts not for their knowlege of practical mining, but because they can write a favourable and attractive report of what they might have been under other circumstances. I quite agree with the suggestton that if any like the Leadenhall-street specimens had come from the Wynaad it is altogether inexplicable that even under the management of the School of Mines men and men of science the properties could have been worked so long without at least accidentally making returns of gold. Remember I do not say that profits would have been earned, but there must have been returns. If Mr. Pegler will state what he knows about the auriferous quartz upon which he based his report, perhaps it will aid us to clear up vhe mystery.

I dealt with No. 2 first, because if the gold which led to the Indian gold mania really came from Australia or somewhere else it would be waste of time to look to any reduction company to get out the precious metal unless it is first shown that auriferous quartz or some other mineral containing gold is found in India. Now, Mr. Cooper states that Claudet can find only traces of arsenic in the Elizabeth reefs, whence I conclude that the free gold referred to does not occur in the reefs, but somewhere else, and the question is whether the gold or the arsenic in the property is the more valuable. I know that the Devon Great Consols made large profits out of their sales of arsenic, and really as a shareholder in Indian gold mines it would matter but little to me whether the profits resulted from arsenic or gold. I, and no doubt many other shareholders, are quite content to take all the ordinary mining risks, as we well know that the average gives a good a good percentage of profit, but we object to mystery and delusion.—*April* 21. PATIENCE.

THE CHERAMBADI DISTRICT, AND MR. LAING.

Sir,—In your report of the Cherambadi District Gold Mining Company's meeting of Feb. 21, I find to my great surprise that Professor or Mr. Vazie Simons stated that I visited Pandy Land with him. I beg to contradict his statement most emphatically, as I never visited Pandy Land or any other properties in his company, and I never met or spoke to him but once, and that was at Sylks Hotel, Ootacamund, about the month of June, 1881. My first visit to Pandy Land was on Nov. 18, 1881, as pre-arranged, and to meet Mr. Phillips. Your kind insertion of this will greatly oblige.

THOMAS LAING,
Late Assistant to Mr. R. Brough Smyth, late Mining Engineer to the Indian Government.

Ootacamund, South India, April 3.

ISABELLE MINE.

Sir,—The account given of this mine by Mr Chalmers, the manager, in last week's Journal, cannot fail to excite the liveliest interest of the shareholders. He is shipping a considerable amount of bullion every week, and the ore is greatly improving in quality. He writes, March 29—"I am still of opinion that you have a splendid mine, and that with an adequate force I can turn out 40 tons of ore per day that will not go below $60 per ton in gold, silver, and copper." *April* 24. SHAREHOLDER.

BRAZILIAN MINING MATTERS.

Sir,—We have been cut off from communication with the outer world by heavy persistent rains which have washed away parts of the railway, caved in a tunnel, and broken down the telegraph wire. Some of the mines have suffered. At Raposos the estimated rain-fall in one night was over four inches. The canal shaft of the Raposos Mines was completely filled with mud and water. The working shaft of the Borges Mine, near Rossa Grande, was also filled up. The dam between the old and new mines (St. John del Rey) at Morro Velho gave way, and the bottom of that mine is full of water.

At Cuiba the new discovery which was much talked of here proved a failure, as the rich ore gave in the stamps less than 2 oits. per ton. I speak of this as I saw samples of the rich ore, and I know that great expectations were entertained of the results to be obtained. I heard that the ore would give many oits. of gold to the ton. The fact that it milled about 1 4-5th oits. leaked out here, and I am satisfied that it is the correct figure. I beg to say that this information was not gained from any of the officers of the company, but I think it a bit of news (all we have just now) worth recording.

Our new President has ordered a special messenger down to the railway to hurry up the long delayed mails. This is our eleventh day without advices from Rio de Janeiro. MINAS.

Ouro Preto, March 6.

ENGLISH ENTERPRISE IN BRAZIL, AND THE CATTA BRANCA BLACKS.

Sir,—I have not yet seen what Mr. Hockin has written in the *Mining Journal* with regard to his confession in this matter, but a translation appeared in the Brazilian Journal do Commercio, and has called forth the contemptuous and scathing remarks of the Brazilian Press, and shows that the editors are well acquainted with the details of this disgraceful affair. It is easy to prove the incorrectness of the statements so skilfully set forth by Mr. Hockin in their defence, to excuse and smooth away the inhumanity practised at Morro Velho for so many years under his auspices, as Chairman of the St. John del Rey Company, by which the laws both of England and Brazil have been set at defiance. Denude the facts of the imaginary circumstances and bunkum in respect to the St. John del Rey Company, with which Mr. Hockin attempts to mystify the reader, they are simply—that in 1845 the St. John del Rey Company made a contract to hire 309 living souls for 14 years—*i.e.* till 1859. These men and women had with them 86 children, 33 of whom were females; the children were not mentioned by name in the contract, but the St. John del Rey Company contracted to absolutely free and emancipate them as they individually attained the age of 21 years. This part of the contract was broken, and none of the youngsters were freed, but they and their children kept in slavery till 1872, and then in spite of the law of Brazil passed in 1871, these free people were registered as slaves for life by Mr. J. N. Gordon, superintendent of the St. John del Rey Company, who had not and could not possibly have any valid authority to enable him to commit such an atrocity, and this he himself well knew, because in a public document dated July 20, 1869, and in other documents he himself (Gordon) declares the Brazilian (Catta Branca) Company to be extinct; and yet Mr. Hockin affirms that Mr. Gordon accepts an authority from a company that he is aware is extinct, and is so declared by his predecessor, Dr. Walker, in 1856 and at other dates. What is the value then of Mr. Hockin's assertion respecting the directors of the two companies when only the St. John del Rey Company was in existence?

In reply to the remark of the danger of 300 slaves (*i.e.*, free people) being suddenly freed, there was really no danger at all, but if they had known their real rights there would have been considerable peril in keeping them in slavery, even in view of all the modes of punishment practised at Morro Velho. The blacks would only have been too glad to have turned their backs upon the locality of their misery and suffering, as they did in 1877, when the St. John del Rey Company did not dare to detain them. Had the contract been fulfilled there would have been in 1859 but a very few old worn out blacks to free—such people as the St. John del Rey Company boast of freeing now—so that the company may not have to pay their funeral expenses. There would have been no inducement to keep a few old worn out blacks in slavery; but here were collected a fine body of people, practical miners, and capable of earning high wages. Mr. Hockin speaks of the interest in the slaves themselves. This interest not only extended to the blacks, but also to the wages earned by them and their own property. This interest so taken was more than either the blacks required or appreciated.

Mr. Hockin asserts the wages were paid to ex-shareholders of an extinct company. This assertion is untenable, but from 1860 to 1873 the receipts are signed by Mr. Edwd. Harding and C. R. Venzeller; in 1874 Edwd. Harding (who died in 1874) and Frederic Catbill; and from 1874 to 1877 F. Catbill only. On commencement of the action liberty, 1877, the payment stopped. Mr. Harding was once superintendent of the Brazilian (Catta Branca) Company. It is doubtful if the others had any legitimate connection with the Brazilian Company, or were in any way entitled or benefitted by the wages of the blacks signed for by them. Soon after the contract was made it was sold to some parties in London, the affairs of the Brazilian Company went into liquidation, and it had no further corporate existence. But from the very first it was the intention to make the blacks as profitable as possible, and under the seeming guise of philanthropy handle the money earned by them. The first contract made was dated May 5, 1845, and provided for the sale of the plant and mines, and hire of the blacks. It was found that such a contract must be registered in Brazil, and anyone could see its contents. Therefore the sale of the plant, &c., was effected by a separate contract, and the hire of the blacks by another contract. The contract for the sale had by law to be registered. Contract for hire did not need to be registered, and could therefore be kept secret, and was in fact kept secret for 17 years.

The excuses now put forward by Mr. Hockin at this late date to keep the real question from the view of the shareholders will not avail, and it is trespassing too much on the credulity of the benevolent to endeavour to palm off pseudo philanthropy when the question of money is solely the cause of all the misery inflicted upon these

unfortunate blacks, while others were luxuriating in the illgotten wealth belonging to them. It is good that Mr. Hockin has at last been induced to come forward in the Catta Branca case. We may now hope to see what he has to say to the other cases of illegal detention of blacks at Morro Velho. ZEBRATO.

Rio de Janeiro, March 23.

THE KAPANGA GOLD MINING COMPANY OF NEW ZEALAND.

SIR,—I am pleased to see that Capt. Thomas, the manager of the Kapanga Gold Mine in New Zealand, has telegraphed home to the directors that—"Since last message we have crushed 30 tons of quartz; the yield has been 86 ozs.; prospects good." This telegram must be most gratifying to the shareholders. It shows them that there is quartz in the Kapanga Mine, and quartz of a far richer quality than was anticipated. There we have proof of quartz in the Kapanga Mine with close upon 3 ozs. of gold to the ton. New Zealand gold fetches nearly 4*l.* the ounce, but we may reckon the Kapanga quartz as being worth 10*l.* 10s. the ton. About 10s. per ton may be deducted for expenses, thus leaving 10*l.* a ton as profit. If 100 tons a week are crushed there would be a profit of more than 50,000*l.* a year, or (say) 50 per cent. dividend on the shares.

My opinion is there is a brilliant future for the Kapanga shareholders, and I doubt very much if any of the 38 Indian gold companies will approach it in richness of quartz. We have already seen a marked improvement in the value of Kapanga shares, but I advise the shareholders not to part with their holdings for the present. I remember but a few years ago these shares rose to over 7*l.* upon receipt of a message announcing the crushing of 30 tons of quartz, with a yield of 119 ozs. of gold. Although the telegram just in does not give quite so good a yield of gold as in the former crushing, still the shareholders ought to congratulate themselves on having nearly 3 ozs. to the ton. A ¼ oz. of gold to the ton will pay in New Zealand. As the Kapanga Mine is provided with the finest machinery in the colony, we shall now probably hear of good crushing results monthly.—*April* 26. A SHAREHOLDER.

THE SUPPLY OF GOLD.

SIR,—From the letter of Mr. Del Mar, in last week's Journal, I notice that he has been travelling in Brazil prospecting for gold, and probably he is now here with the intention of bringing the results of his thorough examination of that country and his discoveries there of "auriferous reefs" or "alluvial deposits" of gold under the notice of British capitalists. Mr. Del Mar may have sufficient scientific enthusiasm to have induced him to devote 12 months of his time to the examination of such a country as Brazil without any idea or prospect of deriving pecuniary profit therefrom; but as I see from his advertisement in the Journal that his business is that of a mining engineer, I may infer that business considerations have been present, if not foremost, in his thoughts in such an undertaking. If so, his object therein is not only a most legitimate but a most praiseworthy one, and his enterprise in the matter, in a business point of view, is but in keeping with the spirit of the age, and deserves the success which I trust will crown it. If he "who makes a blade of grass to grow where one ne'er grew before" is deserving of thanks, certainly much more so is he who discovers or brings into notice and operation new sources of supply of that which is the most powerful and indispensable "motor" of all enterprise—gold.

Mr. Del Mar appears to entertain an unfavourable opinion of the gold mines of India, and to "regard it as futile to look for any important supplies of gold from that country; but while I fear that the "parasites" of mining enterprise have, as usual, been busy at their dirty work in that field, as elsewhere, I have lately conversed with a thoroughly scientific gentleman who is intimately acquainted with most of the auriferous ranges of India, and who has formed a much more favourable opinion of them than that expressed by Mr. Del Mar, and I trust results may yet prove that the opinion of the former is nearer the truth than that of the latter gentleman; and that mongst the numerous Indian gold mining companies which have been recently registered a large proportion may prove to be sound and profitable undertakings. If it should, unfortunately, prove otherwise there is some comfort in the fact that dishonest promoters at all events are likely now to be compelled to disgorge their ill-gotten gains.

As much larger supplies of gold are urgently required, as I have shown in my former letters, I hope Mr. Del Mar may be able to furnish conclusive proof of the value of any placer mines or auriferous reefs he may have examined in Brazil, and may submit as investments to capitalists here. As to that country, I am satisfied that it contains immense mineral wealth to be yet realised by mining enterprise and British capital, but I have not yet directed my attention to its gold deposits, and I, therefore, look forward with great interest to Mr. Del Mar's promised communication in reference to these. I noticed, however, in the Journal of March 25 a letter on the Gold Fields of Guayana, Venezuela, signed "C. and M. E."—who, of course, is known to you, but being unknown to me I am, of course, unable to judge of the value of their testimony—that whereas the auriferous quartz of the Caratal district of that country yields on an average in the mill from 3 to 5 ozs. of gold, the average yield from the quartz of the St. John del Rey Mine, in Brazil, is less than 7-10ths of an ounce to the ton. If that be so—unless Mr. Del Mar has been fortunate enough to discover richer quartz in other districts of that country—it is, perhaps, unfortunate that his steps were not directed to Venezuela in place of to Brazil. I trust, however, his next communication may show that besides the former we have another and neighbouring country in South America, from which large supplies of the metal so precious and so urgently required in much larger quantities for our again, I trust it may prove, largely and rapidly increasing commerce may be soon obtained.—*London, April* 21. F. G. S.

RICHMOND AND ALBION MINES.

SIR,—If dependence can be placed on the enclosed paragraph from the Austin Reveille, the officials of the Richmond Mine have already anticipated the propositions made in your columns as to a purchase of Albion shares. This appears to me to prove that the directors of the Richmond are wide awake, and require no prompting where the interests of the shareholders are concerned. The only weak point I have been able to detect in their management has been their holding such heavy stocks of lead. This policy they may be ble to explain satisfactorily at the next meeting, but I think the shareholders generally would be glad to hear that the reported stock of 10,000 tons had been converted into a cash asset. There has been such an atmosphere of fraud around the Richmond Mine, as disclosed in the filching and exchange of ore, that the shareholders may well begin to ask what assurance there is that the stock of lead has been tampered with. If the employées of the company could abstract hundreds of tons of ore from the interior of the mine without exciting suspicion, and if these practices continued for months without detection, may it not have been quite as easy to handle fraudulently the stock of lead on the surface? At any rate until the lead is converted into cash a grave suspicion may attach as to whether it exists intact. I enclose a paragraph from the Eureka Leader of March 30, which contains a condensed report from Superintendent Robinson, of the Albion Mine, to his directors, which may be interesting to the shareholders of the Richmond Mine, as bearing upon the litigation between the two mines. He assumes that the disputed ground now undisputably belongs to the Albion. This may, of course, be the final result of the appeal, but it looks to me to be very much like "holloing before you are out of the wood" to assume it as a certainty before the appeal is decided by the Court at Washington. H. T.

The Austin Reveille, says the authority quoted, has solved the Albion problem. Hear it! The following is the Reveille's solution of the problem:—The Richmond Company realise the disadvantage of being beaten in the lawsuit. They have anticipated it to the extent of quietly buying up the stock at the lowest procurable rates, and are still quietly absorbing the control. Meanwhile they threaten to carry the case up to the supreme Court of the United States. Tom Wren, their attorney at Carson, the other day judiciously told the Carson Appeal that the whole of the Albion Mine was not worth $25,000, and that appealing the case to the Supreme Court would keep it in litigation for the next three years, during which time the Albion stock would be assessed till there was nothing left of the stockholders. But the Richmond folks know a trick that it is worth two of that. They will not appeal the case at all. In a few days it will be known to the public that the control of the Albion Mine lies in the hands of the Richmond Company. It may be effected by the assistance of some large holders of Albion, but "where there's a will there's a way," especially where there is plenty of money to back up that will, which most certainly is the case with the Richmond Company. "And don't you forget it."

FRONTINO AND BOLIVIA COMPANY.

SIR,—I, like most other shareholders, have been for some time expecting the announcement of a dividend. The Chairman at the annual meeting stated—"What the board intended was that all the money spent properly on capital account should be credited to revenue account, and should form a fund to pay a dividend." I quote from the report of the meeting issued by the directors to the shareholders. I am aware that one gentleman prudishly objected to the repayment to revenue, but evidently that idea was contrary to the opinion and feeling of the meeting; I, therefore, hope the directors will no longer withhold the announcement of at least a 1s. 6d. dividend, especially as the revenue spent by Mr. White was appropriated without any authority of either directors or shareholders, and ought only to be looked upon as a temporary loan to capital. The long patience practised by the shareholders I am sure is exhausted, and most, if not all, shareholders, like myself, are entirely— OUT OF PATIENCE.

NOUVEAU MONDE GOLD MINING COMPANY.

SIR,—How long is the mystery connected with this company to be maintained? Some time since an advertisement appeared in most of the journals soliciting subscriptions on behalf of the Nouveau Monde Mortgage Company to complete the payment of the valuable property recently acquired, and only a part paid for. It was stated a few weeks since that the greater portion of the sum required has been obtained. In the prospectus of the Mortgage Company it was stated that the late directorate has been guilty of gross management, and moreover were greatly to blame in concealing certain facts from the shareholders—more especially those relating to the mine having been fully paid for. I called at the office of the Nouveau Monde Company (in George Yard, Lombard-street) on Monday and was told there was no such company as the Nouveau Monde Mortgage Company in existence. Now what are the patient shareholders to believe, the share fluctuating between 1s. 3d. and 10s.? BONDHOLDER.

Chiswick, April 26.

VALUE OF MINES, MINING COMPANIES, AND THEIR FAILURES.

SIR,—Your compositor has introduced two errors into my letter of the 3rd inst. In the first paragraph you print "instructed with a valuation." It should have been "intrusted with a valuation." In the second paragraph you have printed "24,886*l.*" whereas the number should read "1·24,886"—a very different thing. Kindly insert this in your next. MINING AND CIVIL ENGINEER

Santander, Spain, April 18.

THE NEW GELLIVARE COMPANY.

SIR,—Aware for some lengthened period that this company were engaged in Stockholm endeavouring to enlist financial support to a scheme for its resuscitation and conversion into a Swedish undertaking, in order, under the mantle of a new and national company, to gain access to Government, who had refused to listen to any further overtures emanating from them, circulation is at last given through the medium of the Press to the fourth "*mise en scene*," of this property. With the prospectus before me of the original Gellivare Company (Limited), 6, Copthall-court, their share payments spread over the years 1861, 1862, and 1863. A second company, same property, 85, Cannon-street, West, established Feb. 1, 1864; a third, the existing New Gellivare Company (Limited), with prospectus emanating from 2, Queen-street Place, Southwark Bridge. A fourth being now before the Swedish public I give the various phases of the fabric, having simultaneously before me the printed accounts of the company, upon which I have minutely and extensively expatiated in the columns of the Journal. I ask if with men of highest character, extensive experience, and unlimited resources, as directors of all aforesaid companies, it has been found impossible, for want of access to the iron ore deposit, and for well known reasons, which still exist, in the end to avert engulphing everyone concerned in an irrevocable loss. What inference is to be drawn from the Press paragraph which states that a new company has been formed in Stockholm, on the initiative of the solicitor of the New Gellivare Company (Limited), and a clerk I brought from Stockholm to purchase the Gellivare works, forests, and estate, owned principally by Mr. Loder, of London. Capital 555,480*l.*, in 3362 preference shares of 100*l.* each, receiving 6 per cent. before anything is divided to the ordinary shareholders, and 219,280*l.* in 21,928 ordinary shares of 10*l.* each. All capital to be paid up before starting, in conjunction with the following important indelible disclosure of the state of the company.

At the eleventh ordinary general meeting of the shareholders, reported in the Money Market Review of August 2, 1879, p. 133, Mr. Payne asked, "If you put a value upon the whole of the estate do you think it would be sufficient to pay the mortgages at present existing?" To which Mr. Wilson, a director, and the representative of Mr. Robert Loder, M.P., the mortgagee, answered that it would not, adding "My principal's interest is not paid, but merely added to the already large unpaid interest amount."

Since that period no change has taken place in amelioration of the disastrous position of the company, whose heavy losses on iron manufactured from the crude material, purchased at a distance, on account of the impossibility of access to their own immense deposit of the richest and the purest ore, compelled them to cease working. And as to the wood trade the chairman's words need only be cited—"We hear on all hands of companies and individuals in the wood trade in Sweden collapsing, so that little need be said of our own continuous losses." The chairman further stated—"The redeeming feature is means of transport," which does not exist, and never can be attained by a surface railway in Lapland, the land of snow. What foolhardiness, the most lenient term, of men not bereft of reason, and charitably according to them honesty of purpose, to think of such a scheme, after the experience of the past. An eminent engineer was sent out from Westminster, who surveyed the country in question, the son of the largest railway contractor in the world, visited the estate, which carries more weight than anything else, himself a director of the company, and an eminent practical authority, and the two first precited companies dared not imagine the realisation of a surface railway. The existing company at a general meeting of shareholders confirmed the determination of their predecessors by explaining in a pessimist sense their resolve, when the chairman stated—"The directors were not implicated in a railway project which has since collapsed. Sad will be the day for Sweden when any such a scheme is seriously entertained, and great the responsibilty of the executive if they give same either moral or material support, or indeed any semblance of ægis.

I further ask if with such an important document is it not incumbent on the Swedish Government, as safeguarding the public, to probe to the bottom this announcement, with all its surroundings? I feel a deep interest in the legitimate exploitation of the Gellivare iron ore deposit, and hold myself at the absolute disposal of the Government with data not equalled in England or Sweden. I submit the only way if a national Swedish company is to be constituted is to take the present shareholders' interest at a valuation which is less than nothing. Mr. Loder's mortgage in its present state, and for long, is of no value, but which, as shown in the sequel, is capable of being rendered a lucrative holding. A sliding scale of interest to be paid to Mr. Loder, with a fixed redemption fund. Arbitration will decide its temporary value. By means of my undulating railway and sea transport, and by that medium alone, exhaustively explained in the Journal, which I am prepared, supported by the very highest credentials, to prove to the satisfaction of the Swedish Government as thoroughly practical, the Gellivare estate can be made a remunerative investment. Reiterated fruitless attempts, as stated, have been made experimentally to construct a railway from Gellivare Mountains to the River Lulea, debouching into the Gulf of Bothnia, and any renewed attempt is destined to result in a heavy loss to all concerned. I dare not infringe further upon your valuable space, feeling convinced that this cursory contribution will have due effect with the Swedish Government and financial circles in Sweden.

Little Tower-street, April 24. W. J. THOMPSON.

MINING LAWS IN NORWAY.

SIR,—As mining interests in Norway are renewed by the discoveries of a multitude of seldom rich ore deposits, of which a greater part only is awaiting English capital and energy for developing their richnesses, and as of these some already are and more certainly will be offered to the English public, a short extract of Norwegian mining laws possibly would be of interest for the readers of the *Mining Journal*. In Norway it is, contrary to the British laws, not the landlord but the finder the privilegated owner of a discovered ore lode, except when this lode is situated just in the home field, which is but a little part of the farms, as forests, mountains, pasture fields make the greatest portion. Only when the landlord requires to partake with 1-10th of all costs from beginning of working the mine he has rights to be an owner of 1-10th. This secures mining in Norway against the heavy royalties which in many cases trouble sound mining in England. Only deposits of apatite, felspar, and not metalliferous minerals are belonging to the landlord, also when he is not the finder.

Chapter 1.—About searching for ores: Everyone has a right to search for ores when he has obtained a declaration from the bailiff (lensmand) or the landlord; this paper costs 6d. When an ore lode is discovered he gains the right of possession, when he—1, reports his discovery to the bailiff, and with two men can testify if required where the place of the discovery is; 2, then announce his report for the landlord; 3, then have his report published by the bailiff. His deeds are now in force for 18 months; by old mines who are fallen in the free, six months. Chapter 2.—Rights to work the mine: The finder within these 18 or 6 months can acquire of the Government superintendent of mines by requiring "muthingsbrev"—*i.e.*, title-deeds for working the mine; price about 9s. Chapter 3.—About facts between landlord and mine-owner: Landlord can if he partakes in all expenses with 1-10th from beginning of mining acquire 1-10th of the mine; within six months he is obliged to declare if he will partake or not. The mineowner has full rights to acquire from landlord against damage—either by agreement or by valuation conform to the laws—all necessary ground for ways and foot-paths, for damming and use of water to machinery, washing, for plant, &c.; when required in home field the concession of the landlord may be acquired. Chapter 4.—About measuring of claims: The mineowner can require a claim either 150 fathoms along the lode and 3½ fathoms from each side of the lode, or 2500 fathoms in a rectangular. (Commonly the mineowner requires several claims at once, as he already from the beginning has secured himself the whole lode by reporting 3-10 places of the lode, each 150 fathoms distant, and has thus the right to acquire a claim for every "muthingsbrev.") The law has 12 chapters, the following giving indications for supervision, driving, the superintendents, inspectors, and the facts between mineowner and his workmen, &c.—*Aamdal, April* 15. E. H.

HVIDESEID SILVER AND COPPER MINES.—No. III.

SIR,—As the attention is called to Hvideseid mining district, where since my last letter a great many of former undiscovered ore lodes are found, all containing silver-lead, blue copper (pure ore 56 to 60 per cent. of copper), pure yellow copper without pyrites (of the same fine specie as the Bratsberg Company's ores), I thought a mineralogical valuation of some lodes on the places where they are opened out, and the valuation of some ores could—as pointing out the richness of this best ore-bearing districts in Norway — have some interest for some of your Journal readers. The geological formations at Hvideseid and the western parts of Bratsberg are quite different from the rest of the southern and western parts of Norway; also the ores in that district are of the most gentle nature, all argentiferous. As the copper ores are blue copper and yellow copper without pyrites, they are qualified to a high percentage by dressing, blue copper 30 per cent.; hand picked 50 per cent.; yellow copper 18 to 20 per cent. The copper is also of a fine quality as not containing arsenic, antimony, cobalt, or nickel. There is also found gold as leaf in blue copper ore of one of the lodes, and the owners of Hvideseid mines are advised to and also will have their blue copper ores assayed for gold.

The valuation of some of the above named mines are the following:—No. 2 Mine, Solvberglid: Quartzy lode 2 metre wide, judged holding at least 2 tons silver-lead per fathom; assayed 34 ozs. silver per ton; value of ore when lead ore (80 to 86 per cent.) equal to 9*l.* per ton; silver 51d. per oz., equal to 16*l.* per ton; value of lode in the opened part equal to 32*l.* No. 9 Mine, Nordre Bygstoil: Quartzy lode, 1·5 metre wide; 1-10th of the lode is pure silver-lead, assayed 12 ozs. per ton; value of ore equal to 11*l.* 11s. per ton; value of lode equal to 2¾ tons per fathom, equal to about 23*l.* (Remarks: Another assay, ores occasionally mixed from Nos. 2 and 9 gave 159·9 ozs. of silver per ton). No. 7 Mine, Biorgostoil: Two lodes holding each 4 in. of clean yellow copper in quartzy veins; value of each vein 1 ton of yellow copper per fathom dressed to 18 per cent., and 11s. per unit, equal to 9*l.* 18s. per ton of ore and per fathom of each lode; the ore contains also a little silver, 3 ozs, per ton. No. 10 Mine, Storslaats: Valued 1 ton of blue copper per fathom, quartzy lode; assayed pure ore 155 ozs. silver per ton, dressed to 30 per cent.; the value of ore is 32*l.* 17s. per ton; value of fathom equal to this. No. 11 Mine, Kroksmyr: Valued 1 ton of blue copper per fathom, quartzy lode, 1 metre wide; assayed pure ore 79·6 ozs. silver per ton, dressed to 30 per cent.; value per ton of ore and per fathom equal to 24*l.* 10s. The other number of mines are not opened out enough to allow a valuation, but look promising. Should assays for gold confirm the opinion that the blue copper ores here are constant gold bearing the great value of these ores would increase. OBSERVER.

A NEW SYSTEM OF VENTILATING MINES

SIR,—With reference to Mr. W. H. Jenkins' ingenious project for drawing off fire-damp from coal mines, I notice there is no description of any provision for making up the great loss of hydrogen which would be continually sustained by osmose through the indiarubber or other membranes of the floating valves. It seems to me that there would be the very greatest difficulty in this respect—indeed, I much doubt if it could be accomplished practically. The general idea, however, is an excellent one, and by employing men or boys to open the valves when balloons, singing flames, or other means of detection showed the presence of an abnormal amount of marsh gas, a great element of danger would be removed by the direct withdrawal of at least a portion of the outbursts of gas from the general circulation of the colliery; this, of course, would leave much less work for the ventilating appliances.

Pipes can be laid practically anywhere; it is simply a question of cost, and when the whole expense of an explosion has to be borne by the colliery owners (instead of the general public providing for the widows and orphans as at present by means of Mansion House Funds) there will be much more readiness to try promising schemes for the prevention of explosions. There can be little doubt but that half, if not three-quarters, of these disasters are preventible

A. R S M

BLASTING GELATINE.

SIR,—In the Supplement to last week's Journal particulars are given of the trading of Nobel's Explosive Company for the year 1881. The profits for that year enabled the directors to distribute 36,000*l.* by way of dividends, to pass 10,000*l.* to the reserve fund, and to carry forward a balance of 9737*l.* 1s. 3d. to credit of profit and loss, or together a sum of 55,737*l.* 1s. 3d. In addition, 120,000*l.* has been paid for the goodwill of the business. Truly a respectable sum to obtain from the poor miner and mine adventurer. What is, however, exceedingly curious and interesting is the statement made by Mr. Schaw —"Gelatine is 50 per cent. stronger than the best dynamite, and is destined, the directors believe, to supersede it entirely, and although the dynamite patent has lapsed it has been replaced by others for blasting gelatine, which are much more valuable, comprising as they

do the exclusive right to manufacture and sell this new explosive compound not only in the United Kingdom but in all the British colonies and dependencies." Now, what it is desirable to point out in this language is the following inference:—Enormous profits have been made out of dynamite, but as competitive makers are in the field, which must reduce the profit on this explosive, gelatine must be highly commended, and dynamite shunted. As a matter of fact, however, gelatine is *not* 50 per cent., but only some 10 or 12 per cent. stronger than dynamite of the highest quality. Further, certain mysterious explosions and accidents have occurred in Germany with Nobel's gelatine, indicating that it is not a stable or safe compound, and that its use is likely to be prohibited in that country. K.

SEA CANALS IN GREAT BRITAIN—THE PROPOSED GREAT WESTERN MARITIME.

SIR,—In these days of canal-cutting it may interest your readers to know that a maritime channel on a scale approximating to the dimensions of the Suez and Panama undertakings, and on the sea-level, is contemplated in the West of England, across the isthmus which divides Bridgwater Bay from the estuary of the Exe. It is intended to utilise the local canals, and the next waterway (navigable for screw colliers and other vessels of large tonnage) would unite the English and Bristol Channels, and place the unrivalled resources of the South Wales coal and iron fields and the Midland manufacturing districts within easy reach of the southern and western and south-eastern counties, the Metropolis itself, and the Continent; and, taking Cardiff as a central point, the improved route would, in fact, effect a saving in the sea passage from the Severn ports to the Thames of about 250 miles. The diagram of the suggested ship canal will show its salient features, which may be briefly described as follows:—Saving of time, life, and property; cheapened coal and general merchandise; smoke abatement; increased fish supply. So far back as the latter part of the last century efforts were made to open a communication through the isthmus, and the distinguished names of Brindley, Rennie, and Telford were associated with the inception of the enterprise and the early surveys, and in 1825 an Act was passed for the construction of the English and Bristol Channels ship canal. The subsequent state of the Money Market, however, prevented further progress; but perhaps it is reserved for our age, which has witnessed the revival of great projects and so many triumphs of engineering skill, to accomplish this important work. I purpose giving very shortly the history of former attempts, with the details of the present scheme; and I will now only add that, from the great encouragement I received when I first brought this subject before the notice of the public, I have reason to know that the proposal I have to submit will ensure the favourable consideration of the landowners of the district, the coal and iron masters of South Wales, and the merchants and traders of Bristol, Bridgwater, and the other large towns—the opinion having been generally expressed that the maritime canal is one of the certainties of the future.

Hayes, Middlesex, April 27. FRED. A. OWEN.

UNION TRUST, AND GREY'S BREWERY COMPANY.

SIR,—I am a shareholder in the Union Trust, but have not received a dividend for five months. I saw that one had been declared four or five weeks ago—3s. 9d. per share of 10*l.* each. The dividend is supposed to be paid quarterly, so that this would yield something over 7 per cent. These shares are cited as a very good investment. I think, however, the chief feature of a good investment is absent—the payment of dividends. As I mentioned above, the dividends were supposed to be paid quarterly. They are not paid quarterly, however, but at longer intervals, and thus four are not paid within the year, hence the investment does not yield 7 but ¾ of 7—a little over 5. For the last 12 months the intervals between the payment of dividends have been extending gradually, so that eventually we shall probably lose sight of them altogether. The same gentleman has, until recently, acted as secretary for Grey's Brewery Company as well as the Union Trust, and by a curious coincidence, the irregularity of the payments of the dividends of the former have given rise to some discontent amongst the shareholders. The secretary, at the general meeting of the Grey's Brewery Company, excused himself of the delay by accusing the printer of tardiness. What bosh! Did it not rather betray the incompetence or indifference of secretary or directors? Surely he is aware that there are scores of companies which have their dividend warrants printed, and yet pay their dividends on the first day after they are due. I was rather surprised my fellow-shareholders should accept such an excuse as this. Perhaps, however, things may go on more pleasantly now his business qualifications have earned him a seat at the board.

I mention the above facts, Sir, to ascertain through the medium of your valuable Journal whether other shareholders are in a like predicament with myself with regard to the Union Trust, and would suggest the desirability of paying the dividends (whatever the amount) punctually upon the first day after they are due, be urged upon the directors that a guarantee to that effect be secured from them I trust you will insert this in your paper. SCRUTATOR.

MINING IN CARDIGANSHIRE.

SIR,—Everyone who is interested in mining in this county will be pleased to read the remarks of your valued local correspondent. No doubt as long as the present low price of lead continues it will be difficult, if indeed possible, to make lead mining in Cardiganshire pay, but there is more than this to blame for the present stagnation of mining in this county, for years past we have had all sorts of properties placed with glowing promises on the market, which have only proved traps for the unwary investor. Take the Cambrian, South Cambrian, Cwm Pryf, all cried up as certain to pay dividends, the truth being they never have and never can. These are only a few instances, there are many similar ones. The capital put upon all is far, very far, beyond any value the most successful results could make them worth.

One bright exception is, however, the old and well known Lisburne, the capital of the present company is 7500*l.*, divided into shares of 18*l.* 15s. each, and each such share has had returned to it 612*l.*, or in round figures 245,000*l.*, on an outlay of 7500*l.* This shows what legitimate mining can do. There are other creditable if not quite so bright examples, but which may in time rival even these marvellous results. One of these is the Wemyss Mine, which though registered as a Limited company is really held by only a few gentlemen, and shares are never offered for sale. This mine adjoins the Frongoch, which once formed part of the Lisburne group of mines; in fact, at one time the Wemyss was worked with Frongoch, it has never been in liquidation, nor appeared in any other name, its present name being that of the owners of the soil under which it is worked. It laid idle for some time owing to the unwillingness of the owners to grant a lease at all. The present lessees came forward in a most spirited manner, paid a liberal price for the lease, and laid themselves under a heavy dead rent; it is a matter for congratulation to know that their pluck and perseverance have been rewarded, or to speak more correctly success has crowned the indomitable energy of their resident director (who might not like his name mentioned). Under great discouragements at first this gentleman kept on, and now he has the satisfaction of knowing that he has a property second to none in the county. I beg to say that I wrote these lines without the knowledge of a single shareholder, and not having myself a penny interest in the concern.

That mining in general in the county will once more revive may be looked upon as probable when the generation which has burnt its fingers over so many much-lauded prizes, but sadly disappointing blanks, has passed away; or when holders of mineral properties are content to make equitable arrangements with the public to find capital to develope their mines. No one ought to put a penny into new ventures in Cardiganshire, unless the vendors take all in shares which are to receive no dividend until the public shares have received at least 7½ per cent. for two consecutive years' fairly earned dividends, not dividends paid out of the proceeds of vendors' shares puffed out by elaborate circulars. Do not let us have any more Cambrion Mine scandals in Cardiganshire, although unfortunately the seeds of one or two more such have already been sown.

The mining population of the county are a hard-working, underpaid, thrifty race, and deserve to find employment; but the landlords, with some few exceptions, show a disposition to screw the uttermost farthing from their tenants, both agricultural and mineral, and about the worst of all are the woods and forests, but fortunately they have masters who can control them, as the respected member for the county, Mr. Lewis Pugh Pugh, will shortly show them.

Trusting that the price of lead may soon enable legitimate mining to pay, I will not further trespass on your space. MINER.

April 28.

THE UPPER SEVERN MINING DISTRICT.

SIR,—The Old Siglenlas Mine has been under a dark cloud for a long time, and, consequently, has been called worthless by some; but now the cloud has cleared and the sun is shining on it brighter than ever it did the proprietors are handsomely rewarded for their trouble by a recent discovery of lead ore, which has caused some excitement in the surrounding neighbourhood, and different statements are told respecting it. Hence I went to the mine to see it, and I have great pleasure in being able to state that there has from all probabilities a very valuable discovery of lead ore been made, which quite surpassed my anticipation. The lead is of a rich quality, and several tons are already broken. There are three other lodes traversing this property, and they have been slightly opened upon, and will now at their present shallow depth produce reasonable quantities of lead ore. Their indications are sufficient to satisfy any practical mining engineer that as depth is attained large bodies of lead ore will, doubtless, be the result, and I hope the time will not be long when its neighbour the old Nantmelin Mine will be called upon to produce a little more of its riches, as also the other mines which I referred to in the Journal of last week. They are all in their infancy, and deserve much attention on account of their former productiveness, and there is no question but what they will yet produce abundance of riches. Some of them I can safely say will at any required time produce both lead and copper ores in paying quantities, and time will prove my statements to be correct.

The Snowbrook Mine is likely to make a fresh and energetic start. It was lately visited by a party of mining gentlemen, who, I was informed, took great interest in investigating its future prospects, which I consider are very encouraging. It is very satisfactory to hear that the adjoining mine is turning out so succesful. There are several lodes traversing the Snowbrook mining property. Only one has been opened upon, which has produced thousands of pounds worth of silver-lead ore. Should some of the other lodes be proved to a moderate depth in my opinion the result would be attended with success.—*Llangurig, Montgomery, April* 25. B. P. HANCOCK.

A TOUR AMONG CORNISH MINES.

SIR,—As summer is fast approaching, and many strangers will undoubtedly be attracted to Cornwall, permit me to point out through the medium of the *Mining Journal* an interesting and instructive tour among Cornish mines. Many readers will be pleased at this, as it may form some guidance to them in selecting the most interesting localities, and enable them to see the most with the least expense and time. Should the visitor be a mere tyro in mining it will be well that he should first visit the St. Austell district. Here he will see more of the actual *modus operandi* of mining than in any other district in the county. A journey of superb interest in many respects will be found in a ramble from St. Austell to Bodmin. If a fine day in the midst of summer is selected for this journey a study of the beautiful in May of its most pleasing aspects may be commanded, but if a winter day be fixed on then "Caledonia stern and wild" will find a formidable rival in these romantic regions. Starting from St. Austell the first three miles of the journey is through a beautiful and charming valley, the hills abruptly rising on either side, giving no wide prospect of landscape beauty, but teeming with interesting flora, geological phenomina, and human industry. One might well fancy himself in the land flowing with milk and honey, but it is better not to come to too rash conclusions for the apparent milk is only water holding a large amount of china-clay in suspension, and the honey is rather mental than material.

In passing into this valley from St. Austell town we cross the junction of the granite and killas formations, and are introduced to that form of industry most characteristic of the district—this being the china-clay district *par excellence*. Here works of this description make their appearance on every hand, with all their attendant peculiarities and concomitants—pit, stopes, machinery, settling pits, tanks, dries, &c. Having reached the top of the hill it will be better to take the road to the left a little after leaving Carthew, when we shall soon pass the celebrated Caudle Downs China-Clay Works, on the right of which a fine view is presented, and from which some idea of clay mining as a whole can be obtained; and the much-renowned Vinegar Point on the left, names certainly euphonious if not characteristic. Still further, but only a short distance, to the left is the remarkable Hensbarrow Beacon, rising 1026 ft. above the sea level, with its tumulus of pre-historic interest, commanding a large prospect of interesting and beautiful scenery, stretching away to Rowtor and Brown Willy on the one hand, and Falmouth Harbour on the other, and in two other directions to St. Austell Bay and Newquay. From here we get a splendid view of the far-famed Roche Rocks, and if we have previously cultivated some acquaintance with their history many incidents of romantic and deeply tender interest will be suggested, and we shall not wonder that so many are attracted to its neighbourhood for the recreations of pleasure, and the more important benefits of health. The geologist and mineralogist will also find much in these rocks to interest him, as will also the arcologist.

We shall next pass through the village of Roche, a place of growing importance, which with its rapidly rising houses, telegraphic, postal, railway, and many other facilities, bids fairly to become at not distant date the metropolis of mid-Cornwall, and known to the remotest regions of the world as its flourishing trade brings it into contact with almost every civilised country. From here a visit to the Holy Well, near Victoria, is a matter easily accomplished. Passing Victoria, we should turn to the left into the beautiful valley of Withiel, where the trees will soon be laden with luscious fruits and the air fragrant with the scent of odoriferous flowers. Here one is tempted to linger, and his poetic propensities are impatient to jump into verse. But he must not forget that his tour is for mining purposes, and although he will here experience every pleasure that rural scenery, fertility of soil, congeniality of climate, and adaptability of aspect can present, he must push on to the most interesting object to be met with in his journey—namely, the Mulbery Tin Works. This is indeed an object of no ordinary interest. The scenery is of the same nature and character as that which pertains to mining districts in general—rough and sterile. But the method of mining is different from anything to be met with in any other part of the county, although the same ultimate results are obtained. The works consist of an immense excavation, like an enormous quarry, the hills having been pierced by tunnels, so that tinstuff, when broken, may be carried away from the works by tram-wagons without the processes of lifting and other attendant operations. Tourists going through this part of the country, even though their object may not be to obtain information about mining, should not fail to visit these works, for here they may see the operations of the miner carried on in the light of day. Under ordinary circumstances these operations can only be seen by descending many fathoms below the surface of the earth, through a shaft, and then creeping into levels or caverns and other uninviting places, dripping with water and covered with slime; in constant fear lest something should fall from above to cause some unwelcome accident, or that something will give way beneath and precipitate him into the dark and fatal depths below. It is a real acquisition, therefore, that the tourist should be able to command a view of all the main processes of mining without submitting to any such chances of accident and disagreeable experiences as usually attend these processes, and then only be able to inspect the various processes of excavation by the aid of a flickering candle, which he will be badly able to manage, in constant fear lest some unlucky drop of water or abnormal draught, or other circumstance should extinguish his light, and thus increase the terrors of his situation. These works, too, can be visited by ladies as well as gentlemen with perfect ease and complete safety. This is worthy of being extensively published, for who would not be glad in passing through this locality to make himself acquainted by actual inspection with all the typical processes of mining—viz., excavation, output, stamping the tin, and so on, without fear of accident? Besides this, there is much here to interest the man of science, the phenomenon of the oxide of tin, mixed, as it is here, with a soft good-natured killas, in such large quantities, and with such perfect crystalisation, is not, to my knowledge, to be met with again in this or any other county of England. Hence both the locality and the proprietors must be congratulated on possessing an object of such rare novelty and value. TOURIST.

Roche, April 27.

WHEAL CREBOR.

SIR,—I note in last week's Journal the sale of ore realised 1485*l.* 15s. 6d., although it was estimated from official quarters at 1200*l.* I also see that Devon Great Consols sale only realised 1486*l.* 15s. 6d. for nearly double the quantity of ore. The reports from Wheal Crebor are most satisfactory, and the shaft is now completed from surface to the 132. Now, taking these facts into consideration, can any of your readers explain the reason of the present low price of these shares? Mining business has been dull, we all know; but it seems to me that the prices quoted for these shares are comparatively the lowest in the market. I consider the shareholders of this property have splendid prospects, and will one day find themselves owners of one of the best mines in Cornwall or Devon, and also have the great satisfaction of receiving substantial dividends. Capt Daw has already expressed the same opinion. R. S.

EAST CARADON MINE.

SIR,—Intending investors in mining shares will do well to watch an interesting "point" expected to come off very shortly in the above mine at the 150 east of cross-cut on the caunter lode. The end is at present in elvan, but from the dip and other indications cannot be far off the granite. When the junction takes place Capt. T. Hodge, of Wheal Grenville, and other eminent experts state that the lodes will undoubtedly be found as rich as they were in the old workings.

April 25. SHEPHERD.

THE IDEA OF A HOPE FOR IRELAND.

"Oh Erin, my country, tho' strangers may roam."

SIR,—I will, without apology, trouble you with a few facts. On Saturday evening last, a gentlemen called on me and handed me his card, "Mr. James L'Sange, 770 Broadway, New York." He introduced himself by saying he had been buying a few small matters in Stephen's Green, at a house which he mentioned; and in course of conversation the subject of Irish manufactures had cropped up. That in asking the owner of the establishment some questions as to Irish resources, especially mines, in which he said he was interested, that gentlemen told him that although born in Dublin, he knew more of London or Paris than of Ireland; but if he really wished for information he could direct him to a person who knew the country, and conld no doubt, give it to him; and so he came to me. A glance was sufficient to show I had no swell-mobsman to deal with, and I asked him to let me know the particular information he looked for. "Well, sir," said he, "I have been to England for some time looking about me for a new investment, and in occasional places have heard of Ireland and her mines, but always with the addendum that no one dare go there. Now, I have been in the worst parts of the far West, where a man's hand should always be within reach of his revolver, and having no fear, I determined to have a look at the country for myself, and if you can give me a hint whore to go I shall feel indebted to you."

I told him that any fear of travelling through Ireland was mere humbug. For my part, I would feel less safe in London or Birmingham. I had travelled the length and breadth of the land at all hours, times, and seasons, and was never insulted, even by an English cattle-dealer, though they are sometimes in Ireland rusty customers; and I would let him have letters to persons who could give him information on the mineral wealth of the country. He might rely on me. I was a patriot, but had no monetary interest in any way, I was sorry to say, in her welfare. But did he wish for copper, lead, silver, manganese, cobalt, mundic, baryta, the coarser or more earthly marbles, serpentines, or steatite, I could not only direct him to where all could be had in abundance, but from the cheapness of labour (if the capital was honestly dispensed), open to earn an interest almost fabulous. He said I must excuse him if he told me he did not care for letters of introduction—he liked to see for himself. I then showed him specimens from my little cabinet of copper from Eyries, Cosheen, Colleras, and the Browhead; silver from Keilovinogue, Rooska, Gurtyclova, and Lisheremig, which last will yield 426·7 ozs. of silver per ton, with 25 per cent. of pure copper—this I had from actual analysis from Jermyn-street. Mundic from Kilcrohane, containing gold, silver, and copper; Bantry Bay; baryta from Mountgabriel; cobalt and manganese from Howth, and almost native lead from Clontarf.

This is, I said, not talk; there are the specimens picked up without attention on occasion of random visits! Where did you ever see anything more beautiful than that piece of peacock ore from Berehaven, or that little ornament of pure serpentine from Crowey Head in Donegal? Here is asbestos from Cork and Antrim, and steatite or soap stone from Kilmacrenan. If I had you in the cave at Colleras, under Goleen, beyond Skibbereen, you might pick up specimens of lode bearing 10 per cent. of yellow copper ore.

"Well, sir," said he, "I have put you to great trouble, and I will tell you honestly my motive is to direct American speculators, if possible, to your country. It is now an open field. What you tell me but confirms much that I have gathered from various sources within the past two months, and if I can once get the moneyed men in New York to look at Irish mining as a profitable enterprise, the first quotations in an American paper will give the key-note to a new era of prosperity for Ireland. I will see whether there are not men in America who will embark money in Ireland, not for political absurdities or catch-pennies, or to enrich swindlers, but to reimburse themselves, and bring wealth to the country through her own industrial resources. As I said before, it is an open and undeveloped field."

So, promising to make good use of all I had told him, and that I should again hear from or probably see him before he returned to New York, he departed. I may add that enquiring visitors of this kind are not uncommon.—*Clontarf, April* 13. J. S. S.

A RUSSIAN GEOLOGICAL INSTITUTE.—The Mining Department of the Russian Government has just founded a geological institute corresponding to our geological survey, for the purpose of centralising all geological research in Russia, and preparing a detailed geological map of the empire. In the Budget for 1882, 30,000 roubles are devoted to the work, and the Academician Helmersen has been appointed director. Geological research in Russia is by no means of recent date. Last century several learned travellers collected the first material for a knowledge of the geology of the empire. For the first geological account of Russia we are indebted to Chevkin, which 30 years later induced the celebrated English geologist Murchison, and the French palæontologist Verneuil, to visit the country. Both of these traversed the land in company with several Russian specialists. Murchison's work describing the results of his researches is still a classic, and all recent geological maps of Russia are only improved editions of that prepared by him. The Russian edition of that map was published in 1849 Since then geological researches have become more and more numerous in the country. The Mining Department and private scientific societies in connection with the Universities have conducted a continuous series of geological expeditions, which have considerably advanced a knowledge of the geology of the great empire. All these researches, however, have wanted system and connection; several regions have been explored more than once, while other, not less interesting, regions have been neglected. Of workers since Marchison's visit, may be mentioned the names of Pander, Barbot de Marny, Meglitzki, Karpinski, Muschketor, Möller, Romanowski, Abich, Helmersen, Mostrantyer, Leva-

kovski, Kaiserling, Krapotkin, and others. More than any other country has Russia need of such an institute as has just been founded, as well on account of the extent of the empire, as of its richness in mineral products, and of the impossibility of private enterprise covering the extensive field. For Siberia and the Kirghiz steppes, such a general account of their geology is greatly wanted as Marchison gave of European Russia. The utility of the new geological institute is obvious, and it is only to be wished that it will have ample means at its disposal and soon have the command of a sufficient and competent staff.

THEORY AND PRACTICE.

The contempt, real or pretended, so frequently expressed by so-called practical men for everything which they in their narrow-mindedness can class as theory may be attributed in many instances to the idea which they have contracted that at least in all engineering and constructive work theory means mathematics, and mathematics are something at once incomprehensible and useless. That the mind of a miner or artizan who has never had the advantage of more elementary education than just enables him to write his name, frame an ungrammatical letter or report, and calculate whether he has been properly paid for the number of fathoms he has wrought, and at the price agreed upon, is in a fit condition to derive any material benefit from the perusal of an elaborate mathematical work may be admitted, but happily the crass ignorance of the working classes is rapidly becoming a thing of the past, and at the same time it is becoming more and more recognised that a useful outline of the broad principles of science may be imparted without compelling the student to dive as deeply into the subject as if he intended to make each particular science a speciality. Mathematics have usually been regarded as especially repulsive, and in the mine or workshop he who has gone beyond the elements of arithmetic has been regarded by his fellows as something like a prodigy. They may now learn, however, from the volume* of Mr. FRANCIS CAMPIN that not only arithmetic and algebra, but as much as trigonometry, the differential and integral calculus, mathematical analysis, the laws of force and motion, and so on as is necessary to their wants may be acquired with perseverance and attention with no greater difficulty than they encountered in ascertaining how to calculate the value of a given quantity of ground removed at a given price per fathom, or the length of a given material that will be required to connect two given points within measurable distance with the yardstick.

The several chapters in Mr. Campin's book may be regarded as concise treatises on the several subjects dealt with, the explanations of the nature and objects of mathematics and of the theory of numbers being followed by chapters upon symbols having fixed relative values or aritmetical figures, and upon symbols having arbitrary relative values or algebraical figures. Passing by equations, involution and evolution, and logarithms, we come to chapters on trigonometry and on the differential and integral calculus, in the latter of which the author is careful to show to what class of problems the calculus is applicable, in order, as he remarks, to impart interest to the mode of operation, for the processes of differentiation and integration, if first explained, are excessively wearisome, as they do not in themselves suggest the purposes to which they may be applied. Then, again, there are chapters on mental calculation, mathematical analysis, plane curves, and so on, the first part of the book concluding with a general discourse on mathematics In the second part of the work the several subjects are treated algebraically. Herein Mr. Campin introduces a method of determining "maxima and minima" by simple algebra, which will certainly be appreciated by practical men, for although, as he says, it is not so elegant as the process by the differential calculus, it will be available to those with whom algebra is the limit of their mathematical knowledge.

In his general discourse on mathematics, which, being placed in the middle of the book instead of at the beginning, as usual, is much more likely to be read, Mr. Campin has some interesting observations, which both practical and scientific men might do well to consider. In practical calculation, he remarks, there are two kinds of subject matter for consideration—abstract reasoning and data obtained from experiment. Not many years back theory and practice were held to be eminently on antagonistic terms, but at the present time that idea is becoming modified, although even yet there is an attempt to make a wide distinction between theoretical men and practical men. Let us, he continues, enquire into the difference. The original theoretical man was, in short, supposed to be acquainted with abstract reasoning and with the mode of applying it under given circumstances assumed by himself, but he was not regarded as having a knowledge of the properties of materials, of the circumstances connected with manipulation, and of various emergencies which may lead to breakages that necessarily forced themselves upon the consideration of those who actually handle materials. The practical man, on the other hand, understood thoroughly the material with which he had to work, and knew what could be done with it in the way of manipulation, but had only sufficient knowledge of figures to work out certain rules given to him, or to be found in books, being under the necessity of guessing at anything for which he "had not a rule," because he was unacquainted with primary principles. If we assume two men of equal capacity to follow separate branches, we may produce specimens of these two classes, as it is simply a matter of education, but what is really required is to combine the qualifications in one individual, and then we find, in truth, a practical man. In order to be really practical a man should have a thorough knowledge of the fundamental principles of mathematics, and of their application to mechanics, and also be well acquainted with the properties of the materials to be dealt with, and especially with the variations of quality occurring in different samples of the same kind of materials. To acquire the first class of knowledge simply requires time and application, but the second needs special opportunity and considerable acuteness of observation, and in combining the two for useful application successfully much judgment is indispensable, and careful attention to peculiar circumstances and emergencies.

The method of treatment of the subject adopted by Mr. Campin is well calculated to meet the taste and requirements of the class for whom the volume is especially designed; and it may fairly be said that it would be difficult to find any other volume of equal size from which an equal amount of sound and useful mathematical knowledge could be so easily and quickly obtained.

* "A Treatise on Mathematics as applied to the Constructive Arts." By FRANCIS CAMPIN, C.E. Second Edition. London: Crosby Lookwood and Co., Stationers' Hall-court.

CASSELL'S PUBLICATIONS.—Science for All, part 54, contains the finish of the article How a Bird Flies, and articles on Voltaic Electricity, by Dr. R. J. Mann; on Heat as a Motive Power, by Mr. W. D. Scott-Moncrieff; on the Parallel Roads of Glen Roy, by Prof. T. G. Bonney, F.R.S.; and on Structureless Animals, by Dr. Andrew Wilson. The History of Protestantism, part 35, contains the chapters on the Battles for Presbyterianism and Liberty; on James VI. in England and the Gunpowder Plot; on the Death of James VI. and Spiritual Awakening in Scotland; on the National Covenant and Assembly of 1638; on the Civil War, Solemn League, and Westminster Assembly; on the Triumph of Parliament and beheading of the King; on the Restoration of Charles II. and St. Bartholemew's Day, 1662; on Scotland, Middleton's tyranny and the Act recissory; on the establishment of prelacy in Scotland; on the rejection of the 400 ministers; and on the breach of the Triple League and war of Holland. The next part is to complete the work. Cannon Farrar's "Life and Work of St. Paul," part 4, commences with the chapter on the work and martydom of St. Stephen, and extends to the commencement of the third book. Knight's "Practical Dictionary of Mechanics," part 65 extends from Scale to Seal.

JOINTS.—In furnishing a practical treatise on the Joints Made and Used by Builders in the construction of various kinds of engineering and architectural works, with especial reference to those wrought by artificers in erecting and furnishing habitable structures, Mr. WYVILL J. CHRISTY, architect and surveyor, has rendered an important service to technical education of the more practical kind, and his labour will not fail to be widely appreciated. The volume, which is published by Messrs. Crosby Lockwood and Co., Stationers Hall-court, fills 250 pages, has 160 wood engravings, and is altogether worthy of the author.

LITERARY ANNOUNCEMENTS.—A new work, entitled "The Hall Marking of Jewellery Practically Considered," by George E. Gee, author of "The Goldsmith's Handbook," "The Silversmith's Handbook," &c., is announced for immediate publication by Messrs. Crosby Lockwood and Co., London. The work will include an account of the Assay Towns of the United Kingdom, the Stamps at present employed, and will deal fully with the Laws relating to the Standards and the Marks at all the existing Assay Offices, &c. The same publishers also announce the following as just ready for publication. A new and enlarged edition of "The Manual of Colours and Dye Wares," their properties, applications, valuation, impurities, and sophistications, revised and enlarged by the author, Mr. J. W. Slater. A handy little waistcoat-pocket volume for mechanics, engineers, builders, &c., entitled "Tables, Memoranda, and Calculated Results," selected and arranged in a compact form by Francis Smith. Messrs. Crosby Lockwood and Co. will also issue immediately the following technical works in their popular "Weale's Rudimentary Series":—The Construction of Roofs of Wood and Iron, deduced chiefly from the works of Robison, Tredgold, and Humber, by E. Wyndham Tarn, M.A.; Elementary Decoration, a Guide to the Simpler Forms of Everyday Art as applied to the Interior and Exterior Decoration of Dwelling Houses, by J. W. Facey, jun.; and A Practical Treatise on Handrailing, showing New and Simple Methods for finding the Pitch of the Plank, &c., by George Collings.

THE MINERAL RESOURCES OF INDIA AND THEIR DEVELOPMENT.

In the *Mining Journal* of March 18 a full notice was given of the interesting and exhaustive volume the Economic Geology of India, by Mr. V. Ball, M.A., F.G.S., of the Geological Survey of India, and on Friday last the Mineral Resources of India and their Development formed the subject of a valuable paper by him, read before the Indian Section of the Society of Arts. General statements, he observed, have often been published, but few have attempted hitherto to bring together the information widely scattered in many publications, in regard to any single mineral production which is found in India, and thus the opinions sometimes expressed as to the value of the diamonds, the coal, the gold, the copper, or any of the other numerous products, are likely to have been tinged with the speaker's own particular local experience. You may often meet with one class of writers or speakers who refer to India as abounding, or being exceptionally rich, in valuable minerals; another class will tell you that the minerals of India are worthless. But such confident statements have recently been surpassed by one which the author has ventured to state, that the highest peaks of the Himalayas, under perpetual snow, without doubt contain enormous stores of mineral wealth, which only require the application of scientific knowledge for their development. Upwards of 2000 years ago the mineral productions of India were regarded as being of considerable value and importance, for Megasthenes has written, "India has, underground, numerous veins of all sorts of metals, for it contains much gold and silver, and copper and iron in no small quantity, and even tin and other metals which are employed in making articles of use and ornament, as well as the implements and accoutrements of war." Pliny and Ptolemy, and a host of subsequent writers, have left on record facts of great importance and interest.

India has enjoyed a wide reputation since the earliest times as being a land wherein all, or nearly all, kinds of precious stones were to be found If the term India be applied in the largest sense as including some of the adjoining countries, especially Ceylon, Badakshan, and Burma, the statement is true; but if India be narrowed down to the limits of the peninsula, then some doubt must be expressed as to the occurrence of particular species of precious stones. It is certain that in very early times there were marts in India to which European jewellers repaired in order to purchase many varieties of precious stones, but where some of these stones were obtained is not so clear, and the vague references of travellers are often not of much practical aid; indeed, it often happens, even at present, that it is extremely difficult to trace back to their original source precious stones which have passed through many hands. The diamond-bearing tracts are situated in three widely separated regions —namely, in Madras, in the Central Provinces, with Chutra Nagpur, and in Baudelkhand. The geology of these is all the more or less perfectly known, and it is possible to indicate roughly the limits of the central diamond-bearing strata. That these have been exhausted is most improbable, and in spite of the large quantities of diamonds which have been taken out of the detrial deposits, it seems just to conclude that properly conducted operations would yield as many more, and by means of modern appliances, at a great saving of the amount of time and labour which was formerly expended. Amber, cornudum, ruby, sapphire, spinel, beryl, emerald, garnet, lapis lazuli, turquoise, are all referred to by Mr. Ball, but as to the finding of some of them in India proper he seems to consider that confirmation is necessary.

COAL, PEAT, AND PETROLEUM.

Within the limits of the Indian peninsula the exact number of distinct and named coal fields is estimated by Mr. Ball at 50, but it is to be remembered that the term "field," as applied to these, is not of equal force in all cases. In some it applies to distinct basins, in others to mere outcrops of coal measures on the margins of basins of sedimentary rocks. With similar caution, the coal fields of extra peninsular India may be put down at 36, so that we have a total of 86 fields, of which two only produce 300,000 tons and upwards per annum, and only two or three others are regularly worked. That considerable portions of the presidencies of Madras and Bombay will continue to draw their supplies from abroad seems to be a necessary condition of the distribution of the coal-bearing areas, since Bengal coal from Calcutta, owing to its inferior heating powers, does not show much prospect of being able to compete successfully with foreign coal at Bombay or Madras, while the cost of inland carriage precludes these ports from drawing their supplies from the fields most adjacent to them. In Bengal and the Central Provinces, on the other hand, a considerable development of the working of coal fields is possible. One point, however, cannot be too distinctly insisted on—that it will not pay to make railways to the distant inland basins of Western Bengal and Rewah, simply with a view of bringing more coal to the ports and centres of manufacturing industry. Coal from such fields could not possibly compete profitably with that of the more favourably situated fields which are already worked. The use of such inland fields, therefore, must for many years be confined to supplying the requirements, firstly, of railways, which may pass in their vicinity; and, secondly, of manufacturies, which it may, perhaps, be hoped will be more generally distributed in the future.

True peat is only found on the lofty plateau of the Nilgiris, and in some of the Himalayan regions- Kashmir and Nepal. Accumulations of vegetable matter in certain of the swampy low-lying parts of the country, to which the term has sometimes been applied, have no just claim to the title, and are practically useless as sources of fuel. It is not expected that Nilgiri peat ever have more than a limited local value. The peat of Nepal, and more particularly that of Kashmir, is practically beyond our ken at present. The sources of petroleum are situated wholly in extra-peninsular regions—in the Punjab, in Assam, and in Burma. The total yield from all the springs in the Punjab is not considerable, and in many cases is not worth the cost of collection. Mr. Symon's estimate of the possible yield of petroleum in the Punjab, which he arrived at after an examination of all, or nearly all, the springs, was that they might be calculated to yield 100 gallons a day for eight years, after which the supply would probably fail. Since Mr. Symon wrote gasworks have been established at Rawulpindi, in which the oil obtained at two of the principal localities is manufactured into gas at the rate of 320 cubic feet per gallon, the lighting power being equal to from 14 to 15 candles; and in the year 1880 the total quantity of oil collected amounted to 2850 gallons, at a cost of nearly 8 annas a gallon, or considerably above the retail price of American rock oil in England. The petroleum of Assam has attracted notice for many years, but hitherto attempts to work it have not been successful as commercial speculations. The failure, however, seems to be due to causes other than those attributable to the defects in the quality or quantity of the substance itself. Whether it be true, as has been stated, that the exploitation of the rock oils in Upper Burma has been going on for 2000 years, it is certain that there has for a considerable period been an unfailing supply from this source. Of late years increased facilities for transport, and an increased demand, have called for a proportionately increased out-turn. The so-called Rangoon oil is said to differ from that of British Burma, Assam, and the Punjab, but further proof of this is required.

GOLD, SILVER, COPPER, TIN, AND LEAD.

That a vast quantity of gold has been raised from the soil of India has, Mr. Ball considers, been fully demonstrated by the amplest testimony; but when we attempt by facts at our disposal to estimate the time and labour which have been expended to produce that quantity, we may feel doubt as to the profitable character of the industry. He knows of numerous regions in India where the indigenous gold washers eke out a precarious existance by the practice of their profession. All experience, however, warns us against attaching too much value to the bare fact of the existence of gold in alluvial deposits. It may in some instances indicate the existence of a large supply *in situ*, close at hand; but the actual presence of that large supply requires absolute demonstration in every instance, and cannot be assumed with safety. The fact that India ever produced silver in large quantity has hitherto been doubted by those who have expressed any opinion on the subject; but from evidence which he has obtained as to the abundance of a possible source of silver, he is inclined to accept literally certain ancient and long forgotten references to its having been a silver producing country. Argentiferous ores occur in many parts of the country, and some of them contain high percentages of silver. Copper ores occur in several of the older Indian formations, being sometimes found in regular lodes, but perhaps more commonly disseminated irregularly in the rocks which include them. In Southern India, in Bengal, in Rajputana, in Afghanistan, and in the Himalayas, as well as in some other regions, copper ores were formerly mined to a large extent; this is amply testified to by the magnitude of the ancient workings, many of which were deserted long before they had a historian. At the present moment copper mining and smelting are only carried on in a few remote valleys in the Himalayas and other localities. In the Nellore district, in Southern India, in Singhbhum, in Bengal, and in Kumaon. In the North-West Himalayas attempts made to work the copper by European companies have not proved successful; but we should not, therefore, condemn the prospect which other localities might afford. The failure by the natives, though in many cases due to actual poverty of ore, may, in some, be safely attributed to ignorance and to want of suitable appliances.

Although ores of tin do occur in parts of the Indian Peninsular there is at present no evidence that they are anywhere of sufficient abundance to have been worked by the natives to any large extent; but in the native State of Bustar, in the Central Provinces, the inhabitants, it is believed, smelt a tinstone which is found there; and in the district of Hazaribagh, in Bengal, about the year 1867, an attempt was made by a European to work a deposit of tinstone, but his operations not promising to be remunerative were abandoned. The localities where tin ores are obtainable in Burma are very numerous. The majority of them are included in the strip of land in Tenasserim which extends from Zé to Maleewom for a distance of about 400 miles. The sources of the stream tin, which is found in the majority of the rivers traversing this area, are situated in the range of hills separating British Tenasserim from Siam, and which continue southwards into the Malayan regions, where, as is well known, sources of tin are abundant and prolific. In Northern Burma and in the Shan States other sources of tin ore are believed to exist. The working of the Tenasserim ore is carried on by scattered colonies of Chinese, Shans, and Burmese, and appears to pay them well, but an attempt made a few years ago by a British company at Maleeworn to work according to European methods terminated speedily with loss.

With the exception of iron, there is no metal of which the ores appear to have been worked to so large an extent as have those of lead. The most common ore being galena, which is frequently more more or less argentiferous, sometimes highly so, it seems probable that, as already stated above, the ancient workers devoted their attention to the extraction of the silver rather than to that of the lead. It is certain, however, that in some of the localities considerable quantities of lead were produced, as for instance in Ajmir, where the mines were of great extent, and had in 1830 the appearance of having been worked for centuries. The final closing of these mines took place in the year of the mutiny, owing to a natural desire upon the part of the authorities to make lead for bullets as scarce and difficult to obtain as they possibly could. In peninsular India the ores of lead occur in the older geological formations, and the localities where more or less abundant traces are found are numerous and widespread.

ZINC AND IRON ORES, AND OTHER MINERALS.

Traces of zinc ores have been found in several parts of India, but at only one locality, namely—Jawar or Zawar, in the Udepur State in Rajputana- have they been worked. The mines there were formerly of considerable extent, and the annual revenue derived from them is stated by Tod to have amounted to 222,000 rupees. The principal ore is smithsonite or zinc carbonate, which was reduced in ingeniously contrived retorts. There are reasons for supposing that the same ore occurs in one of the Karnul galena mines, where it was probably treated as refuse, its character not being known to the native miners. Mr. Ball does not attempt to give even a sketch of the wide distribution of all the different ores of iron which are found in India, nor is it possible within the space and time at my disposal to trace the histories of the various efforts which have been made by British companies to establish the profitable manufacture of iron at several widely separated and differently circumstanced localities. The process of iron manufacture as practised by the natives has much of both historical and technical interest connected with it, which constitute a not unprofitable subject for study by itself; and such might be suggested with reference to the improvement and development of that process. The costly experiments which have been made have served to prove several facts, of which the principal are—first, that materials suitable for the manufacture of excellent iron do exist; second, that while in some of the localities chosen the manufacture could not possibly have been conducted with success, in others the conditions were more favourable, and that in consequence of the information so obtained no hesitation need be felt in the selection of the best of localities hereafter should the industry be again started; third, that the iron produced at one locality will only be applicable to certain special purposes, and that from the sameness of the materials employed iron, but of a limited number of varieties, can be produced; fourth, that the margin of profit upon local manufacture will, under the most favourable circumstances, be a very narrow one—so narrow as to be subject to be swept away with the oscillations in prices in the English market. At the same time, it must be borne in mind that India is so large a customer of England that a failure of demand from that quarter would certainly result in that quarter lowering English prices to a considerable extent.

Of the other metals found in India, besides those above mentioned, the most important are platinum, cobalt, manganese, and chromium. The occurrence of mercury is doubtful. Salt has hitherto enjoyed the position of being, in reference to the Indian revenue, by far the most important mineral production. Many other mineral productions with which the Indian Government have to do, such as gold in terms of silver, iron, and coal, are distinguished by the outgoings of revenue, but the salt tax has yielded a net annual income of easy incidence amounting to nearly 7,000,000*l*. The tendency of the latest legislation has been, however, to reduce this amount.

In conclusion, he remarks that the benefits to the native community of an enlarged system of mining might be illustrated by many facts which have come under his own observation in Bengal of people crowding in such numbers to where work was offered them that the managers of the mines have been absolutely compelled to drive them away. The establishment of mining and connected manufacturing industries would afford suitable means of employment, too, for a rapidly increasing class, whose future should be a matter of grave concern to the Indian authorities. He alludes to those of European and Eurasian parentage, the greater portion of whom are in poverty, in consequence of the scarcity of suitable employment.

Many a time has he felt saddened when seeing hundreds of the young lads who turn out on the Calcutta Maidan to play football, and so far show that they have not degenerated, when he reflects that but for a small fraction of them could India in its existing condition afford a profitable and prosperous career.

REPORT FROM CORNWALL.

April 27.—The accuracy of the advice we gave last week when we stated that the present was a time to hold and to buy, and not one to abandon or to sell, has been simply justified by the fluctuations and recoveries which have taken place since these lines were written. It is very satisfactory to find that so very few holders of good shares were induced to throw away their property in the reckless manner current a few years since, and we are not without hope that wiser counsels are gradually prevailing. We may grant that for the time there is a slight check to the consumption of tin, and a consequent increase of stocks, without taking any despondent view, for it is as certain as statistics can make it that the general supply is not now quite equal to the average demand, and speculative operations do not materially affect the position of legitimate and permanent investors.

The capital meeting at East Pool, with its 2*l.* dividend, comes just at the right time, and should have the effect of reassuring shakey adventurers. The value of a mine like East Pool and Dolcoath is not confined to those who are personally interested in its prosperity, but have an effect upon the whole mining interest.

It is stated that a large amount of work is likely to be done in the Cornish granite quarries ere long, several important contracts having been either secured or in course of arrangement. The West of England Granite Company has a large order, and there is a talk of two bridges across the Thames at Putney and Battersea being made of this material. Good news all this for a very fluctuating local industry.

It is with much regret that we record the death of one so prominent and respected in mining circles as Major Hocking (better known, perhaps, to many as Mr. John Hocking, jun.), who has survived his father only a few months. He was a most active member of every association in any way associated with mining enterprise in the West—the Polytechnic, Miners' Association, and Mining Institute—and was a warm promoter of the new Science and Art Schools, Redruth. As a mining engineer his engagements were extensive and important—including Pedn-an-drea, Wheal Agar, West Basset, West Tolgus, while he was purser of Wheal Jane, and a member of the West Basset committee. His loss will be severely felt, for he was a hard worker, zealous in every phase of public and private life, and held in the highest esteem by all who knew him. His early and premature death is due to blood poisoning.

So little has been heard of the Mining Institute of late that some were almost inclined to think it had quietly passed into oblivion. We are glad, however, to say that it is still showing signs of life, and that ere long it may be expected to publish a series of practical and valuable papers.

What with the exaggerations of eager telegraphic reporters and the invention and ready belief of hot-headed partizans, Camborne and its "riots" have excited a vast deal more attention than they deserve. Many of the reports circulated have been of the same kind with that which was first promulgated with respect to the damage to Major Pike's property, which we are very glad to hear are nothing like so serious as was at first stated. For he rest there has unquestionably been a good deal of rough work, but by no means unprovoked, and of which the chief and the original blame does not rest with the Cornishman. It is to be hoped now, however, that the steps which have been taken may prevent a recurrence of the disturbances. They have been bad enough, if not nearly so bad as has been represented, and not worse by any means than happens in other localities where English and Irish come into collision, though in this instance the labour question is not directly mixed up in the controversy.

REPORT FROM DERBYSHIRE AND YORKSHIRE.

April 27.—In the lead mining districts a steady business continues to be done, and there has of late been a fair average output of ore, but nothing has been heard of new ventures for some time past, although Derbyshire lead mining might be fairly considered as really more legitimate than that in other districts to which the attention of capitalists is constantly invited. There are only a few companies engaged in raising lead ore, but they all hold a secondary position as regards one gentleman, who raises as much ore from one of his mines as all the others put together. There are a large number of mines in the county, but some of them are worked without capital and in the most primitive style, and many of these would well repay an outlay of a few hundred pounds in the providing of machinery, the great requisite. Very few ironstone mines are now being worked in the county, the ironmasters depending upon the ample supplies received from Northamptonshire and Lincolnshire. In manufactured iron a moderate business is being done, and at the steelworks at Dronfield there is still a large production of steel rails. The coal trade is quiet, the demand for household qualities, in particular, having fallen off considerably since the Easter holidays. To London the tonnage sent from North Derbyshire and Nottinghamshire has declined of late, and a deputation waited upon the directors of the Midland Railway Company a few days ago, requesting them to make a reduction in the rate, so as to place the colliery owners in the inland district in a position to compete with those who send their coal by sea. It was pointed out that coal was now sent from the Tyne to the Thames at 4s. per ton by screw steamers, whilst from Derbyshire it is about 6s. 2d. per ton. This, of course, gave a very great advantage to the sea-borne coal, but any change made by one railway company as to the rate would necessarily be followed by a corresponding reduction on the part of others engaged in the traffic. Derbyshire has a lower rate by about 1s. 2d. per ton to the Metropolis than South Yorkshire, and it is not likely that the Great Northern would allow the Midland to reduce their charge without following the same course, so that between the two lines, one connected more immediately with Derbyshire and the other with the West Riding, there should not be a difference of more than 1s. 2d. per ton.

In Sheffield trade all round continues good, more especially in the heavier branches, so that the mills are working well. Steel plates are in good demand for vessels of war, and they are now being made seven and eight inches in thickness, whilst iron plates for the same purpose and of nearly equal thickness are also being extensively turned out. The armour plate business, indeed, is now in a high state of activity, good orders being in hand for our own as well as foreign Governments. There is still a good demand for Bessemer, not only for rails but for billets, and for other purposes as well. The sheep-shear trade is now in a high state of activity, this being the busy season as regards our own colonies, as well as South America. Crucible steel is now being more extensively produced, and a large quantity is now required on the part of makers of tyres, wheels, and axles. Cutlery manufacturers are doing a steady business, a good deal of the output being for exportation to the United States, America being now an exceptionally good customer, not only for rails, railway material, but for hardware as well. Of late there has been a marked improvement as regards files, whilst makers of razers, saws, and edge tools are also well employed. The collieries in the district are not working so well, four days a week being the rule in most places, whilst the prices offered for house coal are now actually below the cost of production.

In the Home Office report upon the explosion at Abram Colliery, Wigan, the Inspector says—"The colliery owners had, I think, acted to the best of their judgment, and had spared no expense in providing for the proper ventilation of the workings and the safety of the colliers. That the lamps were not perfectly safe, though in common use in the district, was known to the owners, as is proved by the fact that very shortly before the explosion they were in correspondence with Mr. Hall, her Majesty's Inspector, on the subject." He adds—"I think some immediate steps should be taken to enforce the adoption of a safer lamp than the ordinary Davy lamp into what Mr. Hall speaks as 'fiery' collieries. Until a safer lamp is introduced there will, in my opinion, always be a chance, and that not a remote one, of a repetition of the sad disaster which occurred at the Abram Colliery."

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

April 27.—The reports of last week of a better demand at the Cannock Chase Collieries were confirmed on 'Change in Birmingham this afternoon. But the coalmasters in the Staffordshire district proper were not in a like fortunate position. Still they manage to keep the men employed about four and a-half days' work a week as against the five day's work, which, taking the pits as a whole and striking an average, the Cannock Chase men are employed. Shallow coal raised on the Chase was priced at common hard sorts, useful for manufacturing purposes, 7s. per ton at the pits; seconds, 6s. 6d. per ton; fine slack, 2s. 6d. Ironstone, cokes, and limestone were in abundant supply this afternoon, but sales were not large, since the principal consumers among the pig makers have covered their wants for some time ahead by old contracts. Purple ore was quoted as high as 19s. 6d. per ton delivered, but it was not possible to obtain the figure. Pig-iron was comparatively stagnant, and prices were weaker; 65s. to 67s. 6d. was quoted by one of the best makers of all-mine pigs, who on quarter day asked 70s. to 72s. 6d. per ton. Yet even this fall did not bring out much new business. Part mines were 47s. 6d. to 52s. 6d., and some cinder pigs were to be had at even less than 37s. 6d. The demand for finished iron was quiet, and prices were no better than a week ago.

The attention of the colliers in certain of the South Staffordshire localities has been turned to a suggestion which was thrown out during the recent brief wages struggle as to the desirability of establishing a Conciliation Board, composed of an equal number of masters and men, for the regulation of wages and the settlement of trade disputes. Meetings have been held at which the question has been discussed, and in some localities the men have instructed their representatives to take the necessary steps for the formation of a Board of Conciliation. The masters, however, do not look upon the suggestion with much favour. At their meetings the colliers have also recommended that they should play on Mondays, with the view of preventing over production, which it is considered tends to the lowering of wages.

An engineman named Charles Yearsley, of the Lily Pit, Silverdale, North Staffordshire, was on Wednesday committed by the Potteries stipendiary at Longton to take his trial at the Staffordshire Assizes on a charge of manslaughter. On April 23 a pit ostler, named Samuel Simmons, descended the shaft to look after the horses. Yearsley was lowering the cage, and instead of stopping it at the bottom he let it go into the sump, where Simmons got his arms and legs broken, and was drowned.

At Tunstall County Court last week Mr. Hollinshead, solicitor, representing the relatives of 19 of the 24 men killed by the explosion at the Whitfield Colliery early last year, stated that claims which had been entered on their behalf against the Chatterley Iron Company for compensation under the Employers' Liability Act had been settled, the company having agreed to pay the amount of a year's wages of the men (about 1200*l.*), and also to secure to the relatives the payment of 1600*l.* subscribed for their relief soon after the accident, and kept in hand. Mr. Blakiston, clerk of the peace for Staffordshire, who appeared for the company, said they both collectively and individually did all in their power to assist the sufferers immediately after the accident, and subscribed largely to the relief fund. Although notice of legal proceedings was given within the prescribed period, nothing further was done just before the expiration of the year allowed for entering the action. The company lost 30,000*l.* by the explosion, and being attacked in a hostile spirit they were prepared to defend the actions, which they had endeavoured, but had failed, to remove to a higher court, there being some intricate law points to be raised. Very recently suggestions had been made for a compromise, and the company had agreed to terms, but they emphatically denied any legal liability. They were prepared to prove that the explosion was an explosion not of gas but of coal dust, the dangerous properties of which had only been scientifically demonstrated a year previous to the accident, and ordinary colliery managers could not be expected to understand its explosive nature. The Judge (Mr. Holroyd) expressed his pleasure at the settlement, which had no doubt saved long and costly litigation.

TRADE IN SOUTH WALES.

April 27.—The steam coal trade at the principal South Wales ports has regained its former activity, and the quantity of tonnage available will enable orders to be executed with rapidity. Cardiff has sent away since last report 123,940 tons; Newport, 26,559 tons; and Swansea, 30,135 tons foreign; while coastwise Newport has shipped 19,472 tons, and Swansea 9855 tons. The ironworks of the district are still fairly employed, although there is no apparent pressure anythere. At Cyfarthfa the hitch with regard to the renewal of the lease has been surmounted, and the conversion of the works will probably be at once proceeded with, although nothing can certainly be said on the subject at present. The iron ore trade is active, 10,082 tons having been received at Cardiff since last report, which finds a lanquid market at 16s. per ton. The amount of ore received in 1880 at Cardiff, Newport, and Swansea was more than 50 per cent. of the total of the whole country, but in 1881 there was a considerable falling off, owing to the slackness of the demand for steel and iron rails, but there was an increase at Newcastle and Glasgow owing to the activity of the iron shipbuilding trade.

The stoppage of the Burrows Tin-plate Works at Aberavon, and the announcement of the liquidation of the Nant-y-Glo Tin-plate Company, carried on by Messrs. Gethin, point to a disastrous state of things. It is expected that many of the smaller manufacturers will stop in the next few weeks. The reduction in the output of 15 per cent. has not yet been felt in the district, and it would have been wiser to have taken the step three months ago. Boxes at 16s. at Liverpool points to the loss of 1s. per box to the manufacturers. The death of Colonel Francis, of Swansea, who wrote a history of "The Smelting of Copper in the Swansea District of South Wales from the Time of Elizabeth to the Present Day," is announced. An extract from this work on the means adopted to suppress the copper smoke nuisance by means of Gerstenhoffer's calcining furnace may be appropriate here at the present time:—The object of this invention is by a properly constructed furnace so to divide the ore as it passes from the regulated hoppers on top that it shall fall on a series of triangular bars, and thus become thoroughly subdivided and freed from sulphur before it reaches the bottom. The heat creates sulphurous acid, which passes off through side chambers into condensers, and is thus transformed into a most valuable fertilising article. Our author says:—"When it is remembered that 46,000 tons of sulphur are volatised into 92,000 tons of sulphurous acid; that in the works near Swansea 65,000 cubic metres of this acid are projected into the atmosphere; and that Le Play estimates the annual value of this smoke at 200,000*l.*, we may readily appreciate the importance of the commercial side of the question."

At Tredegar Police Court on Tuesday, before Dr. Coates and the Rev. W. Hughes, a case was heard which occupied nearly four hours, William Withingham and Ajacks Ajacks, colliers, were summoned at the instance of Mr. Stratton, colliery manager, Tredegar, for infringing general rule 8, sub-section 3, by unramming a hole that had missed fire in Pochin pit, on March 2. Mr. Plews conducted the prosecution, and Mr. W. Price defended. The defendants were in the act of drilling the hole out when the cartridge exploded, and each of them lost an eye by their recklessness. The contract for driving the heading was taken by Mr. Evan Thomas, the well-known sinker, and the defendants and others were employed by him. The hole was ready about 12 at noon on the day named, and it was 2'20 when the fireman (John Harrison) came there to light the fuse, and just at the time he was called away to fire a shot in another part of the pit, and when all had moved away, they heard a report, and Harrison remarked to defendants, "There, boys, your hole has fired; go and fill your trams." They went and found the hole as when they left it, and after an examination it was concluded that the shot had missed, or had gone in some soft ground, and defendants set to work to get out the charge, when it exploded with the result already mentioned.—There was much extraneous matter introduced during the hearing of the case.—Mr. Price intimated that the defendants were prosecuted because they had sent in a claim under the Employers' Liability Act.—Mr. Stratton said the prosecution was instituted by Mr. Cadman, Her Majesty's Inspector of Mines, and would have been on sooner but for the correspondence that had taken place.—Mr. Evan Thomas, in his evidence, asserted that the accident was the cause of his dismissal.—The bench consulted for a short time, and decided that the infringement of the rule had been proved, but as the defendants had already been severely punished, the fine would be a small one—viz., 10s. each, including costs.

REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

April 27.—The United Van Consols and Glyn Lead and Barytes Mining Company at their meeting of April 14 earned the distinction so much coveted by our friend Mark-Tapley—that of being jolly under creditable circumstances. According to the Chairman's statement, they have hardly a shot in the locker, the cost-sheet being from 300*l.* to 400*l.*, with nothing to pay it with, he (the Chairman) frequently finding the money himself. And, although Mr. Pryce Jones, the Chairman, holds, as he said, some 25,000*l.* at stake in the company, his address sounds quite the reverse of "dolerws." In happy contrast with former meetings, the last was a singularly limited and consolidated one. The prospect broached by Captain Roach of "tens of thousands" tons of ore in store buoyed the shareholders present up with the pleasures and hope which I at least hope may become the pleasures of reality.

We said that the work of Mr. D. C. Davies, F.G.S., of Oswestry, on "The Metalliferous Deposits of the Counties of Flintshire and Denbighshire," is likely to be published by the Cymmrodorion Society in their Transactions, a number of copies being placed at the disposal of the general public. I am authorised to say that any information relative to the history of mines in those counties will be thankfully received by the author, in order to make the historical part of the book as complete as possible.

A portion of the North Wales colliers have been behaving very badly. Their passions seem to have been roused by some agitators out for an agitational spree from Lancashire. One of these men is guilty of using very false statements as to the average wages earned by the men, together with the usual exaggerated language indulged in on such occasions. The reports in the papers have, I am glad to say, been much exaggerated, the deeds of violence being limited to one colliery and its officials, and the apprehensions of further danger for the most part limited likewise. As I said in my last report, the colliers of North Wales are taken as a whole a law-abiding set of men. It is the younger men whose blood is up. Many of the steadiest and best workmen are leaving for other districts. I must repeat what I have before said, that the men are ill-advised on this occasion, for the North Wales local trade never had such difficulty in holding its own against competition from Lancashire, North and South Staffordshire, and even from South Wales.

Now that the collapse of the Indian gold fever seems as utter as the reports on which it grew were distinguished, it would be very pleasant to have either from Mr. Readwin or Mr Ramsay, or both, a demonstration from results that Welsh gold mining can be successfully carried on.

TRADE OF THE TYNE AND WEAR.

April 26.—The steam coal trade has been somewhat dull this week, and some of the collieries have been on short time in consequence. There is no change in the state of the Durham coal and coke trades. The adjourned meeting of the Durham Coalowners' Association with the Federation Board was held in Newcastle on Saturday for the further discussion of terms for the renewal of the sliding-scale agreement, but no decision was arrived at, and the meeting was again adjourned. A curious accident occurred at the Wardley Colliery on Friday last, in the Hutton seam, which is the lowest seam worked there. A door was propped open but left on its hinges, whereas, in accordance with the rules, it ought to have been taken off the hinges, and this door by some means had been shut, which had the effect of reversing the air current, which might have led to very serious consequences, as a quantity of fire-damp was forced out on to the men's lamps, but fortunately the lamps were removed as quickly as possible, and a serious accident prevented. The man who had neglected to take the door off its hinges was charged at the Gateshead Police Court on Monday with the offence and heavily fined. At the Killingworth Colliery, where the old shaft failed a few days ago, and a large quantity of debris fell to the bottom of the shaft, thus closing the air passage, they are now in course of filling up the pit to the surface, in order to prevent the sinking of the foundations of the erections at the surface. It is uncertain whether the pit will again be opened; it is probable that if the coal seams are again to be worked a new shaft will be sunk.

All the bodies of those killed by the Tudhoe explosion have now been recovered, but some time must elapse ere the workings can be reopened and the ventilation restored. As remarked in this letter last week, the explosion was of a very violent character, and the roadways, &c., in the pit have been much damaged. The bodies of the men killed by the explosion at Stanley Colliery were all recovered in a short time, as the workings there are not so extensive as at Tudhoe and most other mines in the county. This explosion was also a very violent one, the workings are also much damaged, and the roof has fallen in many parts.

The Iron Trade has entered upon quite a new phase, merchants have given way to a certain extent, but makers still adhere to late prices. The downward action in the market is attributed to the Scotch "bears," but the makers may have to give way in the end, as they have done before. At present they are firm at 43s. 6d. for No. 3.

INSTITUTE OF MINING AND MECHANICAL ENGINEERS.—A meeting of members was held on Saturday. The chair was occupied by Mr. G. B. Forster (President), and he delivered his address. After thanking the members for the honour done him in electing him President, he said that one of the principal objects for which the Institute was founded was the attainment of a greater degree of safety in the working of mines. The terrible calamities which, notwithstanding all the scientific appliances and improvements of the present day, have continued to overtake collieries induced the Government to issue a Royal Commission to enquire into accidents in mines, and the possible means of preventing these occurrences or limiting their disastrous consequences. The names of the Commissioners was a sufficient guarantee that the enquiry would be most complete and exhaustive, and it was satisfactory to know that the Commissioners have determined to carry on their researches until they had thoroughly investigated all the points bearing on the subject. The Commissioner, in alluding to the annual number of deaths caused in coal mines, observed that whilst the total number of deaths remained almost the same the number of persons employed had nearly doubled during the last 30 years, so that as compared with the number of persons employed the loss of life had been reduced by one-half. After referring to the ventilation of mines, and describing the modes adopted, he went on to speak of safety-lamps, and said that experience had shown that the Davy, the Stephenson, and the Clanny lamp would under certain circumstances allow the flame to pass through the gauze. It would appear that lamps of the Museler type were free from this defect, as they went out at once on an explosive atmosphere, but they had the disadvantage of depending on the glass, and were also liable to go out if not carefully handled. He hoped the labours and experiments of the Royal Commission would give a standard lamp, and of such a construction that it would be satisfactorily received by all who need to use it. No form of lamp appeared to him to be so simple and useful as that largely used now in Durham—the "tin can" safety-lamp, which consisted of an ordinary Davy lamp incased in a tin cylinder, perforated at the bottom for the admission of air, and open at the top.

He then spoke of coal dust. The effect of coal dust as an adjunct to an explosion had been some time before them, and the results of experiments appeared to show that coal dust not only promoted and extended explosions, but that it might itself be brought into operation as a fiercely busy agent, and when mixed with a small portion of fire-damp it would operate even as an explosive agent. Mr. Lathwray advised frequent watering of the roads, and Mr. Stephenson recommended the use of salt to lay the dust. He next spoke o the detection of fire-damp, and the pressure of gas *in situ*, and said that considerable attention had of late been called to the issue of official issue of "colliery warnings," and it was contended that

should be sent out as occasion might require by the Meteorological Society. Without at all intending to disparage such warnings, or the good intentions of the advocates, he observed that it was still doubtful whether there was really any practical connection between barometric pressure and colliery explosions, as anyone might observe by comparing the recorded variations of the barometer with the dates of such accidents. He admitted that a sudden decrease in the pressure of the atmosphere would probably affect old workings and goafs charged with gas; but it had yet to be proved that it had any appreciable effect on the issue of gas from the coal itself, or that it was in any way connected with those sudden outbursts which produced such disastrous results. The use of gunpowder should not be indiscriminately forbidden. In some mines which were very fiery the general use of gunpowder might be attended with some risk, and in these it might be a question whether it should be either abandoned, or at all events only used on important occasions, and under very stringent rules. But surely there were many degrees of difference between the danger of the most fiery mines and those which practically produce no inflammable gas. It must be evident that in many cases there was really no danger in using powder with proper care and precaution, and he saw no reason why in these it should not be continued; whilst there could be no doubt that there were many such mines, which as far as their knowledge at present went could not be carried on without it. After referring to the Fluess apparatus, and the probability of the electric illumination of mines, he remarked that probably no country could afford a better prospect of acquiring practical knowledge than our own; but it must be confessed that the admirable system of national technical education, so prevalent on the Continent, was not carried out to its full extent in England. The Legislature obliged a manager to pass an examination before he was allowed to have the responsible charge of a mine, but it provided no means by which he could acquire the requisite amount of knowledge. There were many who thought there should be a still higher grade of examination, and should this view ever be adopted he thought it would clearly be the duty of the Government to establish proper mining schools throughout the kingdom, in which our young men might acquire a thorough training for their profession. He congratulated them upon the appointment of a professor of mining at the College of Physical Science in Newcastle; this had been accomplished with the aid of the coal trade of Northumberland and Durham. He went on to speak of the methods of working collieries, sinking, boring machinery, boilers, and coke ovens, safety-hooks, safety-cages, haulage, coal-cutting, mechanical drills, and temperature below the surface. On the motion of Mr. E. F. Boyd, a vote of thanks was passed to the president for his address.

Meetings of Public Companies.

ECONOMIC LIFE ASSURANCE SOCIETY.

The annual general meeting of the members was held at the offices of the society, New Bridge-street, on Saturday,

Mr. H. BARNETT in the chair.

The SECRETARY read the notice calling the meeting, and the report of the auditors. The accounts were taken as read.

The CHAIRMAN said—I dare say you will notice, in the inner side of the sheet, in the accounts some statistics relating to the office which will be of interest to those concerned in it, and I will also make a few remarks upon them. Gentlemen, I think it is tolerably notorious to all persons interested in the business of Life Assurance that last year, 1881, was not altogether a favourable year, and the figures which appear before you will rather testify to the fact that our experience has been in the same direction. At the same time I think if we look carefully into the figures, and analyse them a little, we shall see we have no reason to complain of the position in which our office now stands. If you will allow me I will just draw your attention to a few of the salient points. Now, it is noteworthy that in the year 1881 we had a larger number of proposals than we had in the two previous years, which I think points to the fact that the office has not lost in the esteem of the public. We issued 418 policies in 1881, in 1880 378, and in the year 1879 there were 353, but, on the other side, the amounts for which the proposals were made were altogether lower than has been the case in the last few years; and, moreover, I do not know exactly what we can argue from it, but it is a fact we found ourselves obliged to decline a larger number of policies considerably than we had done in the last year. Well, I suppose that all men of business—in fact, I am afraid that all classes of people in this country have been more or less depressed in circumstances, if I may so say, and that there is not as much money for the purpose of laying by as used to be the case. The same remark was made last year, and I think it is fair to say it appears as if that had resulted in this remarkable circumstance, that while we have had more policies proposed and more issued the number declined has been larger, and the total amount insured has been smaller. It is not a very large difference, but the new premium income that we had last year was 8284*l.*, against 9618*l.* in 1880, being a decrease of about 1300*l.* Then our total premium income also suffered a reduction of 343*l.* in the year, which is really not much on a premium income of 222,000*l.* And, again, our total revenue from premiums and interest only showed a reduction of 500*l.* out of an income of 377,000*l.* That, I think, is so trifling that it is hardly worth noticing. I think it may be probably attributed very fairly to those fluctuations which we know have always taken place in a large life assurance business. Well, then we come to the claims; they have been over our expectations last year. It is not very often that I have had to tell you that the amount has gone over the expectation, but the mere fact of this having been below the expectation on many occasions make it not very remarkable, it should be over the expectation, as by that means we arrive at the average which we must always expect. We had to pay no less than 290,700*l.*, being about 11,000*l.* in excess, although the number of policies that fell in were less by 2 than the expectation. The average age of deaths was a little lower than last year, and a little higher than the year before—63—the average age ranges from 61 to 64. Then we had the satisfaction of giving a large bonus upon one policy. The policy was effected in 1836 for 4200*l.*, the person assured lived to be 89, and on his 4200*l.* we gave him a bonus of 5576*l.*—133 per cent., which I am sure will be very satisfactory to those who receive it, and encouraging to those whose policies are still rolling up. The consequence of all this was that we cancelled reversionary liabilities to the extent of 360,000*l.*; it is odd enough it should happen to be on 360 policies, 1000*l.*, all policy all round, but the reduction of our total liabilites is 90,000*l.*, and, on the other hand, you will see when I come to read the figures that the assurance fund has been increased. The policies in force now are 10,220, being an increase of 58, but the sum assured is 8,307,764*l.*, being a decrease of 19,800*l.* By the policies we have paid the bonuses attached thereto we have decreased our outstanding bonus liability to the amount of nearly 71,000*l.* Our net assurance fund now remains at 3,522,469*l.*, being an increase of 51,766*l.*, and we have now turned the 3½ millions. You will perceive, therefore, that while we have decreased our liabilities to the extent of 90,000*l.*, we have added to our assurance fund nearly 52,000*l.* We have also been able to keep up the rate of interest better than we could have expected, 4*l.* 8*s.* 1*d.* against 4*l.* 8*s.* 2*d.* in the previous year. That is a matter to which we pay great attention with regard to our investments, but as we have been and are still extremely careful in taking nothing but what are really first-class investments, I think the policy-holders will not be surprised if, in future years, there may be some little reduction in the rate of interest which seems to be prevailing over all good securities in these days. Well, then, with regard to the increase of business, we have done what we could to make our office better known, and we have taken steps to increase the number of our agents. We have appointed, after some consideration, a permanent agent at Manchester, a gentleman of the name of Smith, who is not only very intelligent and very active, but, I think, we can augur well from the commencement of business he has made. He has got us a very fair amount of new premiums, and there, as in other places, he has to meet with great competition, and with competition which we must all take into our consideration. In these days it had become the fashion to offer very great inducements to persons bringing policies to insurance offices in the way of commission. I have spoken about this in this room on different occasions before; there was a time when we thought that we might wisely do away with the system of commissions which we had been in the habit of giving; that was after there had been a great outcry, in consequence of the failure of a number of offices, and when it was attributed to a certain extent to the enormous commission they had paid. We tried that for a few years, and I am bound to say we did not find it answer; we, therefore, told you in due time that we had again reverted to the system of paying a moderate commission, and to that we still adhere. We have based this commission not only on practical experience in regard to the business which may be brought by people, but also upon what our actuary has told us we can fairly afford to pay for the purpose of bringing new business to the office. But, on the other hand, there is a system growing up out of doors amongst insurance offices of the highest character of bidding for business on terms which we have no right to say they are not justified in doing, but we have a right to say that our own calculations and our own terms do not justify us in adopting that system. (Cheers.) Of course, it is not for me to criticise what they ought to know would be for their advantage, but I may point out here we have always gone on the principle of holding out to the public the inducement of low premiums, and upon these we cannot afford to give beyond a certain amount in order to attract business. We have invariably claimed public support, partly on those premiums, partly on the large capital that we have accumulated, and it seems to me that this excessive rate of commission will lead the public to look at it in two points of view. I think assurers may fairly say "If you can afford to pay all this money out of what you receive surely you are charging too much for your premiums for the risk you incur." If the premiums are not more than the risk, they are sapping the principles on which life assurances are established. Now, we do not intend to go in for violent competition with regard to payment beyond what is a fair remuneration to agents, who take the trouble, go about, and seek people to bring their insurances to us. We still shall go upon the principle which has guided us throughout, and which has been the mainstay of our office, of giving all we can afford back to our own policy holders, who have contributed so much to raise the fund out of which it comes. With these few remarks I shall beg leave to move that this report be received and adopted. (Cheers.)—Mr. T. K. RICKARDS seconded the motion.

Mr. WARD thought the explanations which had been given by the Chairman with regard to commissions were very satisfactory, especially having regard to the letters which had appeared in the papers on the subject.

The CHAIRMAN said he wished particularly to add that of the 418 policies issued, assuring 269,335*l.* not one penny had been re-insured. He was told that it was not altogether unusual in some offices which had a large business to reckon all the policies which they issued, although they were obliged by the terms of the charter to re-assure a good deal. They took power to increase their assurances from 5000*l.* to 10,000*l.*, but they had not taken during the year, one assurance beyond that amount. It was difficult to say whether it had been altogether satisfactory, because it had not gone long enough. There were not policies enough of any very large amount to arrive at a fair average. In 1880 they issued 11 policies for 5000*l.*, and upwards, and last year only 4. Between 3000*l.* and 4000*l.* they issued 12 policies; in the year before it was 9, but on the whole the increase of the number had been in policies below 1000*l.*, and that ought to be brought prominently forward, because it showed that the class of people who were assuring could not afford quite so large a sum for life assurance as they had often done before.—The resolution was then put and carried.

The sum of 160*l.* was then awarded the auditors for their services during the past year, and Messrs. Alf. Buckley, Hugh M. Gordon, O. E. Grant, and J. L. Daniell were re-elected.—On the motion of Mr. WARD, a vote of thanks was passed to the Chairman and directors for their attention to the interests of the society during the past year.—The CHAIRMAN acknowledged the vote, and the meeting broke-up.

NEW KITTY MINE.

An ordinary general meeting of shareholders was held at the offices of the company, Walbrook, on Wednesday,

Mr. JOHN B. REYNOLDS in the chair.

Mr. FREDERICK J. HARVEY (the secretary) read the notice calling the meeting.

The balance-sheet was also read, showing a balance of cash at the bankers of 255*l.* 9*s.* 9*d.*

Mr HARVEY added—I may mention that one of our largest shareholders, Mr. Payne, has very kindly gone through the accounts with me, and audited them, and appended his certificate as follows:—"I hereby certify that I have examined the above balance-sheet, and compared the same with the books and vouchers of the company, and find it to be correct." There are no liabilities due and unpaid.

The CHAIRMAN: The banker's book is on the table, and the shareholders should look at it; and the accounts are also on the table, which proprietors can inspect. Gentlemen, it is with the greatest pleasure that I meet you to-day, and I always anticipate these gatherings with feelings of unmixed gratification, because I believe we shall more and more appreciate the value of our property, and become still better pleased with the principles upon which we conduct our business. I do not think it is likely we shall have a New Kitty meeting for years to come without being able to encourage one another by some point of interest in our property which had not previously come under our notice, and to-day we find that we may congratulate ourselves upon our near approach to a lode of very considerable importance, known as Lyall's lode. It is without question possible, nay even probable, that when we cut one of these celebrated lodes of St. Agnes we may perhaps intersect it in a poor place, but let that never discourage us. In the adjoining mine (West Kitty) the rich lode was scarcely worth a straw, to all appearance, when first reached, yet to-day we are able to see for ourselves one of the finest deposits of mineral (considering the extent of ground which has been opened up) which can be shown in this country, and what to-day gives me personally more confidence than ever in New Kitty is the direction the rich ore ground is taking in West Kitty. As I have said on previous occasions, I do not wish to infer for a moment that this rich deposit of mineral does not last in depth, as that inference would be unwarranted by the circumstances which are now absolutely transpiring. It is by no means improbable, judging from present appearances, that in depth we shall have as rich deposits as we have in the more shallow workings, and it is fair to assume that in these young mines we shall have to deal with a rich mass of mineral, no doubt poor in places, yet in the aggregate making up a very valuable possession. As far as the tin market is concerned, we meet to-day under circumstances of some excitement, and it is of the most vital importance to us to know whether we can, with any degree of certainty, raise our tin when we get it at a considerable profit to ourselves. If we cannot be morally certain on this point, I do not see there is sufficient justification for any further outlay on our property. We must, therefore, bring to the consideration of this subject that calm judgment and business decision which will enable us to arrive at a result we shall not hereafter regret. Now, gentlemen, we cannot possibly study the position and prospects of New Kitty apart from West Kitty, and this fact is positively the only object I have in naming West Kitty to-day at all. If there is one circumstance clearer than another at the present moment it is that we have in West Kitty an extraordinarily rich deposit of mineral, the prospective value of which it is perfectly impossible to estimate, and at a very shallow depth—that is, shallow as compared with most of the rich tin producing mines in Cornwall, for be it remembered that our deepest point at West Kitty is only 130 fms. from surface. It is anticipated that we shall cut this rich Kitty lode in the New Kitty shaft within about eight months, at a depth of 70 fms. from surface. We have at least a reasonable prospect of finding rich deposits of tin at about that depth in New Kitty, and the question occurs to me what will it cost us per ton to raise our tin, and make it marketable, including all the expenses to which this company may be put. I may state that I have myself made an estimate, although I do not in the slightest degree pretend to be anything like a practical miner; and, according to my belief, we can raise our tin at New Kitty from the shallow levels, from which we shall probably have to draw it at a cost of 25*l.* to 30*l.* per ton. This estimate I think is a liberal one, as in West Kitty it costs us about 30*l.* per ton—a fact, by the way, which will still further enlighten people who are so long in coming to their senses as to the immense value of this mineral district. What, gentlemen, has been the average price of tin for the last 30 years? It is fair to assume that at least we may have somewhere about the benefit of that average in the future. I have made enquiries on this point, and find that the average price of black tin, such as that we shall sell, has been over 60*l.* per ton. As I have before indicated, the tin market now is in a very unsettled state, and the price which we should obtain for our produce if we were to go to market to-day would be not less than 60*l.* per ton. That price would, therefore, leave us a profit of 30*l.* per ton. I would ask, then, am I right in saying that this profit ought to satisfy the miner? If the company could insure such a steady price as this in the future I for one should be more than content to work these mines on my own personal responsibility, supposing that I could not get anyone to aid me in the enterprise. I am glad to say, however, that the opinion entertained by authorities usually correct is to the effect that we shall have black tin at a higher price than even 70*l.* per ton in the near future, and that such price will be more than sustained. The present position of the tin market is altogether exceptional, and is no guide to those who wish to forecast the future. The collapse, of which we have recently witnessed the unfortunate results, has been brought about unquestionably by the pernicious habit of speculators buying what it was impossible for them to pay for. This is a species of speculation of the worst possible description, and when carried to a great extent, as it has been of late, is sure to be followed by short periods of disaster. But, gentlemen, if we to-day at New Kitty had a large quantity of tin for sale the present temporary condition of the maket would not justify our being disturbed in the slightest degree, simply because this company is perfectly free from debt, and we are not obliged, nor shall we be obliged, to go to market in order to meet our expenditure. I do not, I assure you, believe that in any of the mines in the district of St. Agnes we shall be driven to the alternative of stocking our tin, but if we do find it expedient to stock we can do so, and keep our mine as free from debt during the next two or three years as we have done up to the present moment. Therefore, as miners engaged in developing this property legitimately, we have nothing to fear because of these fluctuations in the metal markets. Taking all things into account, the only reasonable conclusion to which I can arrive is that we are in as favourable a position as any miners can be who are working towards those points of interest the value of which has yet to be decided; because, first, there is every reason to suppose that we shall find rich deposits at a shallow depth; and, secondly, because we are morally certain to be able to sell our produce at a great advantage to ourselv It gives me unlimited satisfaction, gentlemen, to be able to place these views before you, feeling assured, as I do, that you must have experienced some little unrest during the last fortnight, and whilst most sincerely hoping that tin may maintain a price which will amply remunerate those who are working in our deepest mines, yet should that unhappily not turn out to be the case, we may consider that our position is assured as far as it can be on account of the exceptional conditions by which we find ourselves surrounded. The A B C balance-sheet now before you speaks for itself. It reminds me of the statement I had the honour of placing before the West Kitty shareholders two brief years since. We then in that mine had only 1 ton of tin in stock, and I ventured to predict that the small beginning was likely to lead up to a very large business. How quickly the accuracy of my prediction is being fulfilled we now see. If on that occasion I was justified in my anticipations respecting West Kitty, how much more am I to-day justified in similar expectations with regard to New Kitty? We know what is transpiring, and it is my confident belief that the results will bring honour to those who have the management of our mine and profit to every shareholder in the company. In conclusion, the Chairman moved the adoption of the balance-sheet.

Mr. COUZENS: Gentlemen, I have very much pleasure in rising to second the resolution which has been proposed by our worthy Chairman, Mr. Reynolds. I have listened with very much pleasure to the financial statement, and to our Chairman's address. Our Chairman always does well, and I think, if possible, he has done better than usual to-day. He has a good theme to speak on. I have often expressed in this room, as well as in other places privately, my confidence in New Kitty, and in some respects it is well not to go over the same ground to-day. I may say that my confidence in the mine is by no means lessened, but rather strengthened by my coming here to-day. I believe we have a large prize in New Kitty, and none of us know what a prize it is. As I was saying to Mr. Payne on my way here, I think the riches of New Kitty very likely will come upon us suddenly—at least we shall have a sudden revelation with respect to the riches of the mine. It is my wont what I do to do thoroughly, and I never go into anything without having information, and the best and soundest information which can be obtained. I spare no time, trouble, or money to obtain it. (Hear, hear.) It is right with respect to all things, and especially with respect to mining. From the information I have I believe we have a very valuable property, as I said before. I know the value of the lodes as they come from West Kitty into New Kitty, and, in fact, I believe it is a repetition of West Kitty. There are valuable lodes coming into West Kitty from Wheal Kitty, and into New Kitty from West Kitty, and I am firmly convinced that those who have patience and will wait will congratulate themselves upon having waited. There are many good points with respect to New Kitty. It is not only that you have two flat lodes, but there are other good lodes in New Kitty, some of which have paid in Old Polbreen Mine an amount exceeding 40,000*l.* in dividends. So we have other riches to come to light, and time will reveal them. (Cheers.) It has been a great encouragement to me during the last fortnight to feel so fully persuaded, from the most minute investigation, that we can produce tin at New and West Kitty at such a low rate as Mr. Reynolds has hinted at. I may further say that the tin which we produce is very rich in character—some of the richest which is to be found in Cornwall, and that is a very important point. (Hear, hear.) We have very rich material, and we can produce it at a very cheap rate, so I think we may have the same confidence in New Kitty as in West Kitty. This has been a source of great satisfaction to me during the past week or two when tin dropped; it did not trouble me. I knew we could make a splendid profit at West Kitty and New Kitty, and we should be satisfied with it. I believe the lode in the 36 cross-cut will soon be cut; in fact, it may be cut whilst we are talking. I have no hesitation in disclosing my own conviction that I believe the paying time is about to commence, and that the mine will pay well. (Cheers.)

The CHAIRMAN then read Capt. Vivian's report as follows:—

April 25.—I beg to hand you the following report of this mine:—Since the meeting held on Jan. 4 last we have sunk the engine-shaft about 5 fms., which is now 3 ft. below the 36 fm. level. We have cut a plat at this level, and the shaftmen are now driving north to intersect Lyall's lode, which I am daily expecting to meet with at this point. I purpose to resume sinking the engine-shaft below the 36 fm. level next week. Judging from the present underlie of the lode in the western part of West Kitty, I consider we have about 10 fms. more to sink the shaft to intersect the West Kitty great flat lode of the district, which is now turning out so rich in that mine. In the 24 fm. level, driving west, the lode has had an improved appearance for the last 6 or 8 ft. and is 3 ft. wide, producing stones of tin and copper ores. In the 14 fm. level, driving west, the lode is small and poor. We have commenced to drive south, as I have reason to believe the principal or main part of the lode to be in that direction. In conclusion, gentlemen, you all know that mining is a speculation, and that all mines do not turn out rich and profitable; but we must not look at New Kitty as a mine in a new district. Seeing that it adjoins Wheal Kitty and West Kitty mines, and has the same lodes the whole length of the sett, you can judge for yourselves as to the probable results equally as well as I can tell you, as most of you know the district, and what the adjoining mines have done and are still doing. This is, I think, an exceptionally valuable property, and by way of commencement we have about 1 ton of tin in stock.—WM. VIVIAN.

Mr. BELLINGHAM asked the depth of the shaft.—Capt. VIVIAN: We are 36 fathoms below the adit level. We are driving at the 24 fathom level and also at the 36.

Mr. BELLINGHAM: And the appearances are good in both?—Capt. VIVIAN: Yes.

Mr. BOOTH: How far have you to sink to reach the West Kitty lode?—Capt. VIVIAN: About 10 fathoms. Should there be a slight change in the underl it would make it a little more or less than 10 fathoms.

Mr. BOOTH: What machinery have you?—Capt. VIVIAN: We have a 36 in. pumping engine.

Mr. BOOTH: Have we any stamps?—Capt. VIVIAN said they had no stamps. They would have to come to steam stamps by-and-bye; but, as he stated at the last meeting, there were water stamps which could be had, and he should prefer going on just in the same way as in West Kitty. Two years ago they had a parcel of 1 ton of tin in West Kitty, and they now had a parcel of 1 ton of tin in New Kitty. At West Kitty they commenced with water stamps, and brought the mine to what it is at present, and they were now putting up steam stamps. In West Kitty they were doing what he had never known before in Cornwall—namely, putting up steam stamps and the mine giving a profit at the same time. (Hear, hear.) Putting up steam stamps in a mine was a costly business, and they had gone on with water stamps, and brought the mine into a paying state, and were now putting up steam stamps without touching the shareholders' pockets, and in the meantime giving them profits. (Cheers.) He should like to bring New Kitty about in the same way, and he hoped they would be able to do so. Of course, mining was more or less of a speculation, but he was as certain as he was standing there that the lodes from Wheal Kitty and West Kitty ran into New Kitty, and that they would find them in New Kitty. (Cheers.)

Mr. PAYNE asked whether the 1 ton of tin at New Kitty came from one point or from several points?—Capt. VIVIAN: We accumulated it from different points. We have been driving three ends; I cannot say that we have put any value upon them, but we have stated from time to time that we have "good stones of tin." That has been going on for 12 months, and if we had not shown any tin you would have said "Where is the tin?" (A laugh.) We have saved the stones, and have got 1 ton of tin. (Hear, hear.)

Mr. PAYNE said he was very much gratified and encouraged by what he had heard, for there was every reason to believe that they would be as successful in New Kitty as in West Kitty. He hoped the shareholders would in large numbers attend the West Kitty July meeting (which, he believed, was to be held on the mine), and judge for themselves of the value of the property. (Hear, hear.)

Capt. VIVIAN: I shall be glad for all the shareholders to come and see the mine.

Mr. BOOTH said he supposed it was not possible to say when the shareholders would have a dividend?—The CHAIRMAN: That is a question which no one can answer. If a dividend were now a very near prospect the market value of the property would be very much better than at present. In West Kitty our first dividend will certainly, I think, be declared in November next. (Cheers.) We are pretty much in the same position in New Kitty now as in West Kitty two years ago.

Mr. COUZENS: It should be mentioned that in New Kitty we have no purchase-money to pay.

The CHAIRMAN: None; the company is perfectly unencumbered.

Capt. VIVIAN, in reply to a question, said New Kitty was a very shallow mine, and, therefore, for some years to come there would be no material increase in the cost of getting the tin.

The resolution for the adoption of the balance-sheet was then put and carried unanimously.

The CHAIRMAN: The next question is one of ways and means. You know our practice; it is always to provide for expenditure before we incur it. (Hear, hear.) We keep ourselves in an excellent financial position by adopting that method. We find it gives confidence everywhere. The calls are so light they are scarcely felt. The difficulty is not in making and collecting the call, but the difficulty is to restrain the enthusiasm of some of our friends who want us to call up more money than is necessary. I should like Mr. Payne to say whether he found the balance-sheet satisfactory?

Mr. PAYNE said he found the accounts most accurately kept, and so simple that any one could see at a glance how matters stood, and he considered that great credit was due to Mr. Harvey for the excellent way in which the account were kept. He said they must, of course, supply money for carrying on the mine, and he was quite sure that the money was well and carefully spent, and that the management generally was as economical as it possibly could be. He moved "That for carrying out the operations of the mine for the next four months a call of 2*s.* per share on the shares of the company be and is hereby declared, payable to the bankers of the company, Messrs. Williams, Williams, and Grylls, Truro, on or before May 16 next."

The resolution having been duly seconded, a SHAREHOLDER asked how much per share had been called up?—Mr. HARVEY said 12*s.* per share when the present call was paid.

The resolution was put and carried unanimously.

Mr. COUZENS moved that the sum of 50*l.* per annum, as from Jan. 1 last, be allowed for office rent in London. He pointed out that a great deal of clerical and other work was involved in connection with the mine at the London office. Up to the present time no office rent in London had been paid, and all the work at the office had been done in the most admirable way; and now that the prospects of the mine were so bright it was only fair that the adventurers should allow something towards the expenses.—Mr. BELLINGHAM seconded the motion, which was put and carried unanimously.

The CHAIRMAN said the next resolution related to a deed. The company had obtained from the Duchy of Cornwall a memorandum giving them a small piece of ground which was inadvertently omitted from the lease. The committee were obliged to be very particular about the limits, owing to the great value of the land in the locality for mining purposes, but the shareholders might rest perfectly satisfied that there would never be the least difficulty regarding mineral rights in New Kitty owing to the care which had been taken

in the matter before the discoveries were made. He moved—"That the proceedings of the committee with reference to the additional ground from the Duchy, documents concerning which were laid on the table, be and are hereby approved."—Mr. PAYNE seconded the motion, which was carried unanimously.

Mr. PAYNE moved the re-election of the committee, with a cordial vote of thanks to them for their past services.

Mr. BOOTH having seconded the motion, the resolution was carried unanimously.—On the motion of Mr. BELLINGHAM, and duly seconded and supported by Mr. COUZENS, a cordial vote of thanks was passed to Capt. Vivian.

The CHAIRMAN added: You may have the most unlimited confidence in all your employees, of whom Capt. Vivian is the chief.

Capt. VIVIAN acknowledged the vote, and, referring to a previous observation, said that the increase of water from the 35 cross-cut was a most favourable feature, and he should not be surprised before he left London to receive a telegram to say that the lode had been cut there. (Cheers.)

A hearty vote of thanks was then passed to the Chairman, and the meeting broke up.

SANTA BARBARA GOLD MINING COMPANY.

The report of the directors prepared for presentation at the meeting in Liverpool to-day expresses regret that the profit shown on the mine working account exhibits some falling off as compared with that of the previous year. The total quantity of mineral raised from the Pari Mine during the year 1881 has amounted to 18,309 tons as compared with 14,452 tons brought to surface in 1880, or an increase of 3857 tons; of this quantity 2426 tons were rejected at the spalling floors as refuse stone, and 15,859 tons treated at the stamping mills, yielding 49,541 oits. of amalgamated gold, or an average produce of 3·123 oits. per ton of mineral treated. This shows an increase in the total produce of 5373 oits. as compared with the previous year, while the average standard of the stone exhibits a decrease of ·750, or ¾ oit. per ton. The quantity of mineral remaining unstamped at Dec. 31 amounted to 58 tons.

The net profit for the year is shown in the mine working account as 2201*l.* 11s. 2d., a less profit than that made during the previous year, although the additional quantity of 4600 tons of mineral was stamped, and the produce augmented by 5373 oits. The result for the year has been unfavourably affected by the considerable increase in the mine working costs, notwithstanding that the expenditure incurred during the previous year, with which comparison is made, was in itself large. The excess in the total expenditure in the mine working account for the past year as compared with 1880 amounts to 3138*l.* 2s.; a close comparison, however, with the cost in the previous year's working account is hardly practicable, by reason of the much larger amount expended this past year on new works account, the different items of which are not separately distinguished in the statement, but are merely deducted under their respective headings. Mr. Treloar states that the heavy cost is to a great extent unavoidable, on account of the nature of the mine works carried on, but he anticipates that an improvement in respect of the working expenses will be shown during the current year, and the directors are confident that Mr. Treloar will before long be able to carry out considerable economies without in any way interfering with the proper working of the mine.

To the amount of net profit as per mine working account of 2201*l.* 11s. 2d. is to be added interest and transfer fees received, less income-tax, as per profit and loss account 104*l.* 7s. 10d., making a total of 2305*l.* 19s.; which, with the balance carried forward from the previous year of 934*l.* 6s. 9d., gives a total at the credit of profit and loss of 3290*l.* 5s. 9d. From this amount the directors recommend that the sum of 500*l.* be added to the reserve fund, increasing the same to 3000*l.*, and that 2300*l.* 16s. 6d. be appropriated to the payment of a dividend on May 30 after the rate of 10 per cent. for the year 1881 on the capital of the company, being 1s. per share on the shares fully-paid up at Dec. 31, 1880, and one-half that amount, or 6d. per share, on the new shares issued. After payment of this dividend there will remain the sum of 489*l.* 9s. 3d., which the directors propose to carry forward.

The mine captain reports that the largest quantity of mineral yet raised in any year has been hauled from the mine during 1881, and this must be deemed satisfactory considering the present limited means of hauling by animals. When the permanent hauling machinery is, however, available the output of ore from the mine will, the directors are informed, be very materially augmented, and the stone be then drawn to surface with more economy and dispatch. The construction of the new works at Pari has been proceeded with during the year with as much dispatch as possible. The new watercourse was well advanced to completion at the close of the year, but the erection of the new hauling and pumping machinery had made but little progress—and the superintendent, Mr. Treloar, does not anticipate that these works can be completed until towards the end of the current year. The outlay on the new works during the year is shown in the balance-sheet as 6402*l.* 0s. 10d. Of the new capital sanctioned for the purposes of these new works, some 12,000 shares have been already issued, and the directors trust that the balance of some 8000 shares, still unissued, may be allotted before long.

JAVALI COMPANY.

The report of the directors, prepared for presentation at the meeting on Tuesday next, states that the accounts for the year ended Dec. 31, show a profit on the year's working of 986*l.*, towards paying 1739*l.* due on the year for debenture interest. The value of the ore per ton is lower than it has been in any year since 1873, but the amount of ore crushed has been largely in excess of that in previous years, and the expenditure per ton has been brought down to a very low figure. During the year the Esperanza Mine has been attacked, and four additional stamps were erected in June for crushing its produce. By comparing the figures for the first half of the year with those for the last six months, not only was a larger quantity crushed (due partly to its being the wet season), but the average value of the ore was raised to a paying point.

The year 1882 begins with a promising aspect. Four more stamps have been erected, and the gross returns for the first two months exceed those of the corresponding period in 1881 by upwards of 900*l.*, and should this favourable state of affairs be maintained there is a fair prospect that the payment of past due debentures may be resumed in a few months.

PITANGUI GOLD MINING COMPANY.

The report of the directors prepared for presentation at the meeting in Liverpool to-day expresses regret that the operations at the mine exhibit so unfavourable a result. The gold return for 1881 has amounted to 14,972¼ oits. realising 6497*l.* 15s. 6d., making with interest and transfer fees received a total of 6557*l.*, whilst the working expenses, after charging 813*l.* to capital account in respect of the new works executed during the year, have been 9668*l.* 7s. 10d., leaving a deficit of 3111*l.* 8s. The manager's annual report and that of the mine captain, enter fully into the details of the operations at Pitangui during the year, and explain that the want of success is mainly caused by the great difficulty experienced in draining the mine, anticipations held out in the directors' last report of obtaining regular returns of ore from the upper part of the mine having been frustrated on account of the presence of water below the 15. The directors are glad to state that the measures adopted for the driving of the 30 intended for the deeper drainage of this upper part of the mine, appear to have met with some success, inasmuch as limited stoping operations had been resumed in the Jose Candido section in the month of February of the current year, although the water was still troublesome, and would no doubt continue to be so until the 30 had been advanced some considerable distance further. The yield of the veins in the upper part of the mine has not realised the expectations based on the reports of their richness in former times; as Mr. Treloar points out, however, in his report, it has not been possible on account of the water to work on all the veins to a sufficient depth to enable a fair judgement as yet to be formed of their value.

Operations on the Ouro Podre vein have been under suspension the whole of the year on account of this section being still under water, and although Mr. Treloar holds out hopes in his annual report of being enabled to drain this part of the mine below the 30, by means of a new level, it will have been seen by the latest advices from the mine, duly communicated by circular to the shareholders, that his anticipations have not been realised, owing to the treacherous state of the ground rendering it advisable not to further prosecute the driving of the new level for fear of damage to the works above. The completion of the 30 as far as Holland's shaft will no doubt prove the value of the different veins in the upper part of the mine, but whether these veins will be found to be rich in depth or otherwise it is, of course, impossible to predict, owing to the fluctuating nature of the returns from jacotinga mines.

EAST POOL.—At the meeting of shareholders on Tuesday (Mr. George A. Michell in the chair) the accounts for the twelve weeks ended April 12 showed a profit of 13,880*l.* 12s. 8d., and a total credit balance of 16,497*l.* 16s. 8d. A dividend of 12,800*l.* (2*l.* per share) was declared and 3355*l.* 6s. 8d. carried forward to reserve fund account. On the motion of Mr. Lockett, seconded by Mr. Arthur Fox, 5*l.* per month, for twelve months, was voted to Capt. Maynard's widow in recognition of the services rendered to the mine by her late husband. Capts. Charles F. Bishop, J. Penhale, and S. Curtis, reported upon the various points of operation. The report was considered highly satisfactory, the mine looking prosperous in every direction. The question of a vote for the Camborne Science and Art School was further adjourned. The purser (Mr. Martyn) remarked that during the last twelve weeks they had sent 7066 tons 4 cwts. of tin stone to the stamps, as compared with 7074 tons 10 cwts. in the previous quarter. They had sent 380 tons 4 cwts. 2 qrs. 27 lbs. of tin to the stamps; they had sold from the stamps 381 tons 17 cwts. 2 qrs. 3 lbs. The average assay for the past twelve weeks was 1 cwt. 8¼ lbs. per ton of stuff, and in the previous quarter it was ¼ cwt. 18 lbs. per ton of stuff. The average price per ton was 61*l.* 0s. 7d., as compared with 60*l.* 9s. per ton in the previous twelve weeks. Before the shareholders separated Capt. Bishop came in with the pleasing intelligence that the 170, on the south lode, was communicated with the winze from the 160. In the report it was stated that it was expected to be done in a few days.

THARSIS COPPER AND SULPHUR COMPANY.—The annual meeting of shareholders was held at Glasgow, on Wednesday (Mr. Charles Tennant, M.P., in the chair). In moving the reception and adoption of the report, a full abstract of which was published in last week's *Mining Journal*, the Chairman said that notwithstanding adverse circumstances they had done a large and profitable business during the year, and were able to recommend a dividend of 25 per cent. for the ten months embraced in the report, or at the rate of 30 per cent. per annum, after writing off 25,000*l.* for depreciation, adding 20,000*l.* to the reserve fund, and carrying over 22,723*l.* to the next year's profit and loss account. This large amount was carried forward in view of the possibility of being required to pay the dividend on the 2*l.* uncalled upon the 7*l.* shares, should the decision on the case now before the Court with regard to this matter be against the company, which result the directors did not anticipate. As regarded future prospects, the price of copper and iron ore had advanced, and there would be a saving in freights as compared with last year. From the extension of the ammonia process, and the adoption of a sulphur recovery process, the consumption of sulphur was not unlikely to suffer serious diminution, but economies in connection with other departments it was hoped would compensate any reduction it might be found necessary to make in the price of the article.

FOREIGN MINING AND METALLURGY.

The results of an adjudication of a considerable quantity of coal to be supplied to the Belgian State Railways shows that Belgian coal mining industry is still in a relatively favourable condition. The prices of last summer, which were at the time considered very high, were fairly maintained at the adjudication, and even slightly exceeded. There was also little difference between the various tenders submitted. Under these circumstances, the position of the Belgian collieries may be considered as fairly favourable. There is still no change to report in coke upon the Belgian markets. A strike has occurred in the Levant du Flénu; it is not expected, however, that this strike, which affects from 1200 to 1500 workmen, will be of long duration. The German coal trade has not presented any material change, although the general tendency is rather downwards than otherwise. German coalowners do not appear to be very well satisfied with the turn which affairs have taken of late; they feel that although the present year presented itself under favourable auspices it is not altogether likely to now fulfil its promises. There has been no important change in quotations thus far, but a feeling of depression prevails. The production of the Saarbruck mines amounted in the year ending March 31, 1882, to 5,176,000 tons. The corresponding production in the year ending March 31, 1881, was 5,089,000 tons, so that the extraction increased in 1881-2 to the extent of 87,000 tons. The stock decreased at the same time to the extent of 42,000 tons. The production of the Dortmund coal basin amounted in 1881 to 23,664,000 tons, as compared with 22,495,000 tons in 1880.

Prices for iron have been maintained at the French forges, thanks to a certain abundance of orders, but upon the Paris market a downward tendency has become apparent, Merchants' iron has been dealt in at 87. 4s. per ton, a price which is not considered to leave a sufficient margin of profit. The German iron trade has not regained a better tone; it appears, on the contrary, to exhibit a rather more marked depression. This result is principally attributable to discouraging advices received from England. The semi-official prices current are not well supported upon the German markets. A contract for axles has been secured at Cologne by the Bochum Steel Works Company. During the past month the tendency of the Austrian iron markets has scarcely changed; business does not show much animation, but, at the same time, the works are fairly provided with orders. There has been a slight recoil in the quotations current for pig, in consequence of the fall which has occurred upon the English and Scotch markets. All other articles have been the object of regular transactions, which have not, however, acquired a very great development, as consumers are fairly well supplied, for the most part, for six months to come. There has been a rather active demand for iron for construction purposes and bars. Plates have also been in request—indeed, many works have been scarcely able to supply them fast enough. The introduction of a new Customs tariff has not exercised at present any influence upon quotations current for iron in Austria. The Austrian rolling mills are well employed, and the same may be said of the Austrian locomotive works, which expect to receive a large number of orders on home account as soon as they have completed the engines which they have contracted to supply to certain French railway companies.

The Belgian iron trade presents a generally quiet tone. The downward movement noticed of late appears to have been checked, but at the same time there has been no serious indication of a revival in affairs. The good tendency observed a week or two since has not continued with all the firmness desirable. Some transactions have been carried through, but many have been left pending, and it is difficult to see at present upon which side the balance will ultimately incline. There appears to be a general impression that the Belgian iron trade is at present in a state of transition, the issue of which cannot be foretold. This state of things tells severely upon the less solidly established industrials, who are obliged to secure employment upon almost any terms. Even the strongest and best established are also compelled to make some concessions in regard to prices. Quotations for pig have been pretty well maintained. The production of the Athus Works is said to be engaged until the end of June. A slight recoil has been noticed in the Luxembourg in the rates current for pig, but prices are still better maintained in that quarter than in Belgium. Quotations for iron have shown a good deal of irregularity in Belgium. Girders are quoted at about 6*l.* per ton, but concessions would be made in the case of any important transaction. Plates have been in no great request, but in most cases have brought 7*l.* 12s. per ton. The construction of the Ambleve Railway is about to be commenced. This line has long been called for by the industrials of the Liege Basin.

COLLIERY ACCIDENTS AND THE RESCUE OF MINERS.

As it may now be assumed that practical men in all countries admit that colliery accidents are not altogether preventible, it is essential that in every district apparatus for facilitating the rescue of men who may be accidentally imprisoned underground should be provided, so as to be within easy reach of every mine in operation. In connection with recent accidents in the North mention has several times been made of the Fluess apparatus; it will, therefore, be interesting to many to have some further particulars concerning it, and these will be more readily understood by comparing it with the ordinary diving apparatus, which it much resembles. The efficiency of diving apparatus, when made by firms of reputation, does not vary considerably, and for the present purpose the descriptions given by Messrs. Barnett and Foster, well known makers, will be sufficient. They very truly remark that a diving apparatus should be so designed and constructed that quite an inexperienced man should be able to understand and feel confidence in using it for the first time. It may lay out of use for a considerable time, and when required for an emergency it often happens that a trained diver cannot be had; hence the apparatus should be simple in its construction, so that it may be used by any one at any time. As Messrs. Barnett and Foster's apparatus are the result of nearly half a century's practical experience, it may be assumed that it is worthy of confidence.

The ordinary diving apparatus may be best described as consisting of four distinct portions—the air-engine, the helmet, the dress, and the air-tubes—and in each of these the firm mentioned have from time to time introduced important improvements. Thus in the air-engine they have introduced the dial pressure indicator for denoting the amount of speed the air-engine should be driven at to keep the diver evenly supplied; the cooling cistern, which surrounds the three barrels, and is for the purpose of supplying air at a low temperature, and the condensing chamber, which prevents the supply being intermittent, and also contains sufficient condensed air to supply a diver a considerable time after the pumps have ceased working. In the helmet they use three glasses of thick plate glass, averaging five-eighths of an inch in thickness, instead of thin glass, with protecting guards across, which are really no protection against breakage, besides obstructing the sight. The front eye, instead of being made to unscrew, when required to be opened, is made by them on a hinged joint, so that the diver may open or close it himself when coming to the surface without fear of dropping it; it is made on the same principle as a scuttle light of a ship. Another notable improvement in the helmet is the valve, which is now constructed so that it cannot get out of order, nor can the diver be confused as to which way to turn it for more or less air. It is simply a valve in a ground seating, and it is perfectly self-acting. Should the diver require more air, or wish to inflate his dress to come to the surface of the water, he has only to place his finger on the stem of the valve, and so close it; if he require to sink again, or even while at work feels himself oppressed with too much air, he has only to hold the stem of the valve away from its seating, when the excess of air escapes; under either of these circumstances when the diver removes his finger the proper operation of the valve commences again, and so goes on self-acting. This valve is placed at the side of the helmet towards the back. It is a great disadvantage to have a valve in front, as the escaping air would be continually bubbling up in front of the glass, and so obstruct the view. Where the tube is connected to the helmet a stop valve is put, so that in case of an accident by the breaking of the air-tube this valve immediately closes, and prevents the air rushing out, or the water rushing in, and sufficient air is generally in the body of the dress to allow time for the diver to signal to be drawn up, The segmental screw for immediately removing the helmet from the shoulder-piece is from its simplicity now universally adopted. In the weights attached to the helmet a great improvement will be noticed over the arrangement of other makers; they are so slung that although secure in their place on the helmet when in use they are removed instantly from off the diver's shoulders when coming to the surface—this is most important.

With regard to the dress itself, it is observed that there has been little alteration in this for many years, excepting that the manufacturers have considerably improved the quality of the fabric of which the dress is made, and rendered it more suitable for the purpose to which it is applied. The most important improvement, however, was added by Messrs. Barnett and Foster a few years since, and consists in the insertion of a socket and cup in the centre, for the convenience of the diver to urine, instead of his having to disconnect helmet and lower dress, generally an occupation that required the greater part of an hour before he could again descend. In the manufacture of the air tube, great improvements have been made within the last few years. As formerly made, the tube depended for its strength upon the thickness of the rubber of which it was composed; Messrs. Barnett and Foster now make it with three layers of canvass embedded between alternate layers of rubber, and also give it extra strength by placing a spiral wire in the centre. They have made an additional improvement by embedding this wire, and so leaving a clear passage through the tube. The object of this is to prevent the squeaking sound caused by the rush of air down the spiral wire, and also to prevent any corrosion that might occur on the wire being blown into the helmet. It is most important that the tube should be strong, as however perfect the air engine and helmet may be, an accident with the tube might prove fatal. It is also necessary that the tube be light as well as strong, for in many cases the diver prefers the tube to float rather have it drag along the ground, as this obstructs his operations, besides in rocky ground causing great wear of the tube.

But the matter of greatest interest to the readers of the *Mining Journal* is the modification of the diver's suit—the costume for exploring mines or other places when charged with poisonous or explosive gases. In mining it is often necessary to go into an atmosphere where poisonous gases exist, either for repairs, for the purpose of inspection, to set a charge for blasting, and for many other objects. Now the dress, helmet, and accessories of an ordinary diving apparatus, although answering the purpose, would be found much too heavy for working above water; they, therefore, construct a light though strong head gear and dress for the above purpose. The frame of the helmet is made of wickerwork, and the dress covers over this completely, and is tied at the waist and wrists. In the front of the helmet is a glass eye, 6 in. by 4 in., mounted in a hinged wooden frame, for lightness. The material of which the dress is composed is very strong, but light; at the back of the head piece is inserted a piece of tube, to which is to be fastened whatever length may be required for supplying fresh air. In many places, especially if only at a distance of a few feet, the air may be supplied by means of any ordinary pair of household bellows, but if at a distance of (say) 50 ft. or more, it is necessary to have a small air pump to force air to persons using it. It requires but very little pressure to keep up a circulation, as it has no valve to force open to discharge the air, which in this case passes out at the bottom of dress where tied round the waist. Such an apparatus costs but a few guineas, and as it would frequently be the means of saving many valuable lives its general adoption cannot be too strongly urged upon mining engineers and all concerned with the management of collieries.

DYNAMO-ELECTRIC MACHINES.—In machines of the usual construction only one armature is employed, which revolves directly between the field magnets, which may be either excited by the current derived from the armature, or they may be separately excited. The invention of Mr. H. A. HARBOROW, of Marylebone, consists in causing an armature, the wire upon which is wound longitudinally in two or more separate coils, to revolve within and in the opposite direction to a soft iron ring or second armature external to but enclosing it. The ring or second armature being wound with segments of wire, suitable mechanism is provided so that the two armatures shall revolve in opposite directions when desired, or they can be disconnected the one from the other, and made to revolve independently, the current from each armature being led to one or more separate commutators, and collected by brushes in the usual manner. External to and enclosing both the armatures are placed the field magnets, which are so arranged as to be excited by either of the armatures or both of them, or they can be excited independently.

COAL MINES IN CHINA.—The Kaiping coal mines have been closed in deference to the opinion expressed by the censor that the continued working of them would release the Earth Dragon, disturb the *manes* of the Empress, and bring trouble upon the Imperial family.

New pearling grounds, supposed to be from 15 to 20 miles long, have been discovered off Beagle Bay, on the north coast of Western Australia. There has been a general stampede of all boats on the coast to the spot, and the take-off of shells is expected to be unprecedented.

FOREIGN MINES.

The following were unavoidably crowded out last week:—

ST. JOHN DEL REY MINING COMPANY (Limited) — Advices received April 17, 1882, ex Mondego (s.), dated Morro Velho, March. 18:—

GENERAL OPERATIONS.—GOLD PRODUCE FOR THE MONTH OF FEBRUARY.—The gold extracted during the above period amounts to 19,933·4 oits., equal to 2297·9965 ozs. troy, and has been derived as follows:—

	Oits.		Tons.	Oits. per ton.
General mineral	12,071·3	from	3520 =	3·429
ditto Praia	1,451·0	,,	475 =	3·054
Mineral free from killas	5,100·8	,,	1190 =	4·286
	18,623·1	,,	5185 =	3·590
Re-treatment	1,300·3	,,	— =	0·252
	19,923·4	,,	5185 =	3·842
Add recovered from retort plates	10·0			
Total	19,933·4			

The low yield per ton is due to the flooding of the sump and adjacent stopes, whereby we are deprived from working in the most productive parts of the excavation. The unfortunate breakage of a pump-rod in the shaft has greatly retarded the work of draining the mine, and I much fear, even under the most favourable circumstances, it cannot be accomplished in less time than a month from this date.

COST AND PROFIT.

Produce for February..	19,933·4 oits.	
Less loss in melting ...	111·1 ,,	
	19,822·3 oits., at 7s. 9d. per oit.....	£ 7,681 2 10
Cost, at 21¼d. ex. =		6,493 11 0
Profit for the month		£1,187 11 10

MINE.—Mineral raised from the mine..... 5613 tons
Mineral quarried per borer per diem..... 2·41 ,,
Average attendance of borers daily ..... 95·92
Average attendance of natives daily ..... 287·25

Owing to the partial failure of the dam in the cross-cut communicating with the old mine, and the consequent flowing of water into the sump, it has not been practicable to take the usual monthly measurements.

Up to the period when operations were suspended there was no change to note either in the size or quality of the lode in the sump and adjacent stopes.

A platform has been erected below the bar, whereon is deposited for greater facility of hauling the mineral quarried in stopes Nos. 3, 4, and 5. The stone appears to be of a promising nature.

SECTION 298 B.—This stope is now 33 ft. wide, but in consequence of passing through a branch of killas the mineral obtained therefrom was not of a very high grade.

SECTION 297 B.—This stope has increased 10 ft. in width, whereof 18 ft. in the centre is composed of quartz, the lode on either side being mineral of apparently productive quality.

SECTION 296 B.—The work of stripping down the north wall adjacent to the slide has been carried on with vigour, but without disclosing any new feature.

WESTERN STOPES 234 D, AND 255 A.—No material change has occurred since last reported.

EASTERN DRIVING, SECTION 218.—Extended 11 ft. Lode as last reported—very poor.

CUIABA COST AND PRODUCE.

Expenditure on capital account, surface buildings, and other works	£ 821	7 6
Mine development, new machinery, deep adit and milling, 99 tons of ore	740	1 9
Total cost	£1561	9 3
Less value of produce 99 oits. at 8s. 1d. per oitava	40	0 3
Excess of expenditure	£1521	9 0

MINE.—Deep Adit—Distance driven during the month 13 fms. 1 ft. 2 in.
Total distance driven 269 4 0

Considering the nature of the ground passed through the above duty should be considered satisfactory.

Towards the latter part of the month a body of mineral of such a compact and apparently rich nature was intersected, that for some days it was the opinion of the manager and mine captain that the lode had been reached. Although this expectation has not altogether been realised this circumstance should indicate a near approach to the lode.

Vaz's sink sunk vertically during the month ... 1 fm. 0 ft. 0 in.
Total vertical distance 19 3 5

Owing to the force being urgently required elsewhere, the average amount of sinking was not accomplished.

MORRO VELHO—GOLD EXTRACTED TO DATE.—The produce for the first division of March, a period of 11 days, amounts to 6688·6 oits., equal to 771·0865 ozs. troy, and has been derived as follows:—

	Oits.		Tons.	Oits. per ton.
General mineral	4,291·5	from	1312 =	3·270
ditto Praia	606·2	,,	178 =	3·405
Mineral free from killas	1,447·6	,,	400 =	3·619
	6345·3	,,	1890 =	3·357
Re-treatment	343·3	,,	— =	0·180
Total	6,688·6	,,	1890 =	3·534

The continued low yield per ton of mineral treated is due to the cause already explained.

MINE.—Return of duty for 14 working days:—

Mineral raised from the mine	3434 tons.
Mineral quarried per borer per diem	2·34 ,,
Average attendance of borers daily	104·71
Average attendance of natives daily	298·50

No change to advise.

Telegrams received:—On March 22, dated Rio, 22nd—"Produce for 11 days (first division of March), 6750 oits.; yield, 3·5 oits. per ton; profit for the month of February, 1200*l*."

On March 30, dated Rio, 30th:—"Produce 10 days (second division of March), 6250 oits.; yield, 3·4 oits. per ton."

On April 12, dated Rio, 10th—"Produce for the month of March, 19,500 oits.; yield 3·5 oits. per ton."

BIRDSEYE.—J. S. Goodwin, March 15: From the 1st of this month up to the 10th the weather was clear and cold, since which it has moderated just enough to give us several rousing snowstorms; notwithstanding we have been able to wash nearly full time at the Neece and West and Red Dog with the aid of what water we could get from the Yuba Company, which has been limited, as they are obliged to use most of their water to keep the snow from filling the ditches. Our washing so far at the Neece and West has been confined to the east rim; but as our expenses have been light at this claim we may look for a fair profit; also from the Red Dog claim, and am in hopes to be able to remit a little, if not much. By this you will understand that I mean to do the best I can. (Telegram already to hand, remittance $4000).—The Mallory Claim: After having run our prospect tunnel ahead 40 ft., we have raised an incline through the bedrock to gravel; from here we run on the bedrock 20 ft.; finding the rock gradually running, I withdrew, and am now running north from the foot of the Mallory incline towards the Uncle Sam ground. This being the lowest gravel, I think we should cross-cut right and left every 50 ft., thereby prospecting the entire claim as we go. I expect Mr. Powers over here as soon as the roads are passable. To-day the snow is falling in sheets. The ditch agent just called to tell me that a tree had fallen across a flume at the head of ditch, consequently I must close this, and go with men to the head of ditch at once; it would be impossible to get there in the morning if it continues to snow. You can imagine what a pleasant trip we are to make; it is like searching for the North Pole. As I can lead a gang of men to such work as this better than I can write a letter I will bid you farewell.

NUNDYDROOG GOLD.—B. D. Plummer, March 28: Mining: We have started to drive another cross-cut in the engine-shaft on the Maharajah reef east. The indications are such as to induce me to think that we might find a reef in that direction; while the western cross-cut is in search of the reef we passed through in the engine-shaft, and in which gold was found. Hence we have to drive two cross-cuts to thoroughly test this ground. The cross-cuts on the Maharajah Reef are in course of driving east and west at the 95. The rock in the west end has a kindly appearance; it is light-coloured mica slate, with occasional small strings of brown clay and friable quartz; it it letting out water from the far end, and altogether at this time I like its appearance. The eastern cross-cut is only just started, but the rock is more favourable to drive than its appearance first warranted. The rock is more compact, and is principally mica and hornblende schist.—Maharajah Reef North: The new shaft here has somewhat changed since my last report. There is now a mixture of quartz and other vein matters in the shape of branches crossing the shaft in an easterly and westerly direction. This shaft is nearly as deep as it should be put before the cross-cuts will be driven. Another shaft has been commenced at 30 fms. to the south of this. This will be known as the intermediate shaft, and will explore the ground some distance nearer to the engine-shaft. When this shaft has been sunk to some depth I think another, yet nearer to the engine-shaft, must be sunk, to thoroughly test the ground on the Maharajah Reef. In this shaft (just started) we have cut through a large bed of quartz, but the reefs must be cut through some little distance from surface before I shall be able to say anything as to their value.—M'Taggart's Shaft: The cross-cuts at the M'Taggart's shaft are progressing; a full pare of coolies are employed in each; the drawing-engine and lifting apparatus will be set to regular work in a few days' time; at present we are putting in the railroad at the 70 ft. level.—Stamps and Buildings: The work in connection with these progresses well.

BROADWAY GOLD.—J. W. Plummer, March 29: Broadway Mine: The 75 has been extended 3 ft., making a total of 635 ft. from the shaft. The fissure is wide but split, showing small branches of ore and limestone. We are driving through the heart of it, and expect every day to see the vein resume its prolific character. In addition to driving the 75 we have sunk a winze 7 ft. deep. This winze shows branches of ore and horses of limestone between. The branches of ore have every sign of coming together, and will undoubtedly do so after we pass through the present local disturbance.—New Shaft: The footwall has been cut down to the grade of the incline, and the side placed in line with the upper portions of the shaft. We have, as I informed you in my last, been obliged to leave the vein, which, however, we hope to cut again at an early date. We have found the footwall proper (gneiss), and on it a small branch of ore. This branch, although small and unimportant in itself, proves that it is really necessary to get the gneissic footwall condemning any section of the mine.—Stopes: We are breaking from the same stopes still, and hoisting some of the ore through the old shaft, and stowing all we can underground. We have hoisted for the week 100 tons only, and about 150 tons of waste. Our accounts stand as follows:—On hand, March22, 2400 tons; raised for week ending 29th inst., 100 tons: total, 2500 tons. Hauled to mill, 800 tons; total on hand, 2200 tons.—Mutual Agreement Mine: No work performed since my last. We sampled the whole of the body of ore uncovered by our works, and found it to contain only a trace of gold.—Milling: We have had no hindrances in our milling operations since my last other than the common stoppages incidental to all milling. We have been working 30 stamps steadily, and as soon as our new shoes come we will start up the 40.

YORKE PENINSULA.—The directors have advices from the committee of inspection of the company at Adelaide, with reports from the Kurilla Mine to March 7. The following are extracts from the report of T. and J. Anthony:—"Kurilla Lode: In the tunnel from Hall's shaft, in the 67, towards Morphett's lode, we have not yet got through the hard rock, and only 11 ft. added to its length, making a total of 21 fms. 5 ft., with about 15 fms. to reach Morphett's lode. In the stope in the back of the 67, east of Hall's, the yield is 2½ tons of 16 per cent. ore per fathom. In the 55, on the south branch, east of Hall's, the lode is producing good stones of ore, but not enough to pay. In the 55, on the north part of the lode, the stope is yielding 3 tons of 16 per cent. ore per fathom. In the same level, west of the cross-cut, on the south branch, the lode is worth 2 tons of 16 per cent. ore per fathom. We have temporarily stopped driving the 45 east, on the south branch, and put the men to sink a winze from that level to the 55; this winze will open tribute ground. In the 35 east, on the north part of the lode, it has improved, yielding nearly 1 ton of good ore per fathom. As soon as a cross-head or other favourable guide is met with we shall drive south to test the value of the south branch. In the 25 east, in section 398, the lode is highly promising, but not at present yielding sufficient ore to pay. The tribute stope reported last month has been suspended from want of air. Four men are sinking a winze below the last-mentioned drive. From the winze where the lode was displaced by a floor the lode is now worth 4 tons of 15 per cent. ore per fathom. In the 15, in section 398, four men are sinking a winze, which will open tribute ground. Four men are working on tribute in the back of the 15, at an average of 8s. 6d. in 1*l*. At and about Gurner's shaft, in section 398, we have extended the 10 in a south-west direction a distance of 8 fathoms, through a good lode of green and grey ore; the yield per fathom is not yet apparent, as both walls cannot yet be seen distinctly. From the surface we have run down a shaft for purposes of ventilation and discharge, and erected a whip, and the prospect seems good. The shallow deposit was followed by only occasional stones of ore, but in the 10 the lode was struck in the south end of the shaft, and every indication exists of continuance upwards, at least for some distance towards the surface. Two men are driving a trial cross-cut in the 10 a little west of Gurner's northwards, to see if the Kurilla lode lies further north. A trial pit has been put down a little north of Gurner's shaft from the surface, and a box of ore, about 1 ton, was found at a depth of 10 ft., but we were unable to trace it away. Two men are now driving across the strata a few fathoms east of Gurner's, at a depth of 10 ft., to see if the lode can be picked up there. Another trial and vent shaft has been put down 9 fathoms from the surface, a few fathoms west of Gurner's shaft, and some paying lode has been laid open thereby.—Morphett's Lode: In the 55 east the lode is hard and poor, and for the present we are employing the men to blast out a piece of lode, to prepare a new stope west of the face of the drivage. We have also removed the men temporarily from the 55 west to sink a winze to the 67, to be ready for the drivage east of the tunnel when it shall reach this lode. Twenty men are stoping the back of the 55, and the lode will average 3 tons per fathom. The south part of the lode in the 43 east is producing some good ore, but we are not yet able to express an opinion on what the future is likely to be. In the 30, east of the shaft, we are driving west of the cross-cut on the north branch, and are following a very promising vein of ore. Two men are working on tribute in the 30, in the north branch, at 7s. tribute.—Machinery: All the engines and dressing machinery are working well."—Ore returns: 270 tons of ore had been sold in the colony, and there remained on hand at the mine 1424 tons of about 16 per cent., besides low-class ores.

CORPORATION OF SOUTH AUSTRALIAN COPPER MINES.—The latest reports of captains at the various properties now being worked by this company are annexed;—Blinman: Capt. W. J. Paull: A present we have 15 bullock teams, comprising 142 bullocks, working for us here. We could give employment to forty more teams wood carting for smelting and other purposes. I have lit a slow fire in the furnaces for smelting, which will not be forced until to-morrow night. Fair progress has been made with the new buildings this week. The loading and heavy walls of the engine-house are complete. The lode at the 30 is on the whole better than the average of the mine, and is worth 15*l.* per fathom. The winze at the bottom of the 25 produces low quality crusher work. The men have finished their bargain at the south shaft. The ground is crusher work, with good stones of best ore. We are now completing the timbering.

Wheal Friendship: Captain W. J. Paull: In the south end the lode is large and strong, and has produced some good stones of ore during the week. No wall has been seen in this end for several fathoms. I think the time has come for sinking a permanent shaft at this mine.

Garrett's Mine: Capt. W. J. Paull: The water here is very strong, and we shall not be able to sink any more after this month. The lode is still in two parts, but would most probably come together in 2 ft. or 3 ft. more sinking. One branch is large, and contains a great deal of spar and iron with spots and stones of copper ore and mundic. There are two better walls to this lode than I have seen in any other mine in the North.

Nildotte Mine: Capt. W. J. Paull: The men have sunk about 2 fathoms. The lode is from 1 ft. to 16 in. wide. New the centre of the shaft there is a small branch of galena and a little silver obliquely crossing the lode. Probably there are from 2 cwts. to 3 cwts. broken.

Mount Rose Mine: Capt. Gribble: I am highly pleased to see the result of the sample broken from the lode in shaft—44¾ per cent. fine copper. I am proceeding favourably with the engine-shaft. As soon as the materials arrive I intend putting a party of men on the Gammon Creek Mine and also at the Vocca Voccnnd. A general store has been opened on the mine by Mr. Hantke, and I am happy to say we have struck good water at the bottom of the well we have been sinking. On the whole things are in a very proming condition.

Beltana Mine; Capt. Tregometh: We are waiting the arrival of tramway rails to enable us to continue sinking the underlay shaft. We have cleared up No. 1 shaft to the 10, and have timbered 5 fathoms thereof. Have sunk trial pits in other likely places where ore is showing, and have filled several bags of ore, and shall push on at these places when time permits.

Leigh's Creek: Capt. Williams: Have secured top of Branchs' shaft, fixed windlass, and cleaned up to the 16. Have set a pare of them to drive and open the end. This shaft is 18 fathoms deep. As soon as more miners arrive will start sinking the south shaft in the west lode. Have traced the west lode over the hills south of the creek. It has been opened on a little, and some stones of good ore obtained. There is a good lode here to follow, and I shall try it all along the lode when I get more men.

Capt. W. J. Paull, writing from Bienman on March 6, reports:—The furnace is now in full swing and doing good work. We had a good tap of regulus this evening.

PESTARENA.—S. Gifford, April 15: Val Toppa: At the intermediate level under zero it is believed that the new lode line has been found again, but the men are brought back for a week to make a sink for holing the rise from No. 1. In the cross-cut from No. 1 west, the rock continues stiff micaceous schist, and in No. 1 end south on new lode there is a little improvement in the quantity of ore, the yield being about 8 tons of 5 dwts. per ton. The rise from back of No. 1 on new lode is now near the bottom of the level above, with but little lode to be seen, whilst the driving south at same level on flat lode has also become very poor, but strings of pyrites continue to make through the rock, which gives hopes of ore in front. The cross-cut going out east from this goes forth in soft schist. At No. 2 south on new lode the quartz has become a little smaller with a continued low grade. The rise on west branch at No. 3 has got entirely in schist, and it is hoped communication will soon be made. The stopes continued to give about the usual quantity of ore, but it barely suffices to keep the mills goitg.—Pestarena—No. 1 Lode: The 80 end north continues in sterile ground, but in the 100 end south there is a well defined lode in stiff rock underlying west, and producing 5 tons of ore of 15 dwts. per fathom. The winze under this level shows the ore nearly spliced out at present, there being only 3 tons of 15 dwts. per fathom, but it will come in again, as there is a lode worth 5 tons of 18 dwts. in the rise from the 110 coming up against it. The winze under this latter level is now going down on the eastern part of the lode, which carries about 6 tons of ore of 1 oz. per fathom. In the 120 south the lode is more regular, but has less ore being worth 4 tons of 10 dwts. per fathom only. In the north end the men are cross-cutting west to make the tip-plat. In the incline shaft mineralised ground with strings of ore is showing in the west end.—No. 5 Lode: The 33 end north has a well defined line of division with patches of quartz in the country rock without ore, whilst in the 65 end but little work has been done, and the lode remains the same. At the winze under the 65, driving to make the new sink has been started in a lode worth 5 tons of 16 dwts. per fathom, and in the rise against it from the 90 broken branches of ore are coming in now, yielding 3 tons of 18 dwts. per fathom. The favourable change seen in the 90 north did not hold and the end is again poor.—Pozzone: Cutting down the adit has now reached the point where the level is filled, and clearing is being carried forward to reach the end and commence driving.

LINARES.—April 12: The lode in the 115, driving east of Warne's engine-shaft, is very open, and yielding good stones of ore. The 130, driving east of Warne's engine-shaft, is opening up a good length of productive ground, valued at 2 tons per fathom. There is no improvement in the 130, driving west of Warne's engine-shaft. In the 115, driving in the same direction, there is a large kindly lode, yielding fine lumps of ore worth 2 tons per fathom. The lode in the 135, driving west of Peill's engine-shaft, is very regular, and of a promising appearance, producing 1 ton of ore per fathom. In the 120, driving west of Peill's engine-shaft, the lode has fallen off in value to ½ per fathom. The 135, driving east of Peill's engine-shaft, continues unproductive. The lode in the 120, driving east of Peill's engine-shaft, has improved to ½ ton per fathom. In the 105, driving east of San Francisco shaft, there is a regular and well defined lode, producing 1½ ton per fathom. In No. 242 winze sinking below the 115 the lode is small and poor. No. 243 winze sinking below the 115 is going down in a very fine shoot of ore, worth 4 tons per fathom. In No. 244 winze sinking below the 105, the lode has fallen off in value to 1 ton per fathom.—Quinientos Mine: In the 100, driving east of Taylor's engine-shaft, the lode contains a little ore, but nothing to value. The 90, driving in the same direction, is opening up a fine run of ore ground worth 3 tons per fathom. In Martinez winze, sinking below the 90, the lode is very open, consisting chiefly of carbonate of lime, and yielding fine lumps of ore valued at 1 ton per fathom.—Majada Honda Mine: In the 30, driving east of Enriqueta shaft, the lode is large and strong, but it does not contain any ore at present. The 70, driving east of San Francisco engine-shaft, is opening up moderately productive ground, worth 1 ton per fathom. The lode in the 70, driving east of San Francisco cross-cut, has improved to ¾ ton per fm. In the 70, driving east of south to Tomas shaft, the lode is small and unproductive. Alonzo's winze, sinking below the 60, is going down in a well defined lode, producing 1½ ton per fathom.

FORTUNA.—April 12: Canada Incosa Mine: In the 120, driving west of O'Shea's engine-shaft, there is an open, regular, and promising lode. The lode in the 70, driving west of San Pedro's shaft, is gradually improving. In the 80, driving west of San Pedro's shaft, a valuable piece of ore ground was opened up in the past month, worth 1½ ton per fathom. The lode in the 90, driving in the same direction, is looking a little better than it was, producing ½ ton of ore per fathom. The lode in the 90, driving east of San Pedro's shaft, is small, with stones of ore. The 120, driving east of O'Shea's engine-shaft, is being opened up at a good rate. In the 100, driving east of Lownde's shaft, the lode continues small, but has improved in value to ¾ ton per fathom. The lode in the 80 driving east of St. Thomas' shaft, is small and unproductive. Isidora's winze, sinking below the 80, is going down in a productive lode, worth 1 ton per fm. In Antero's winze, sinking below the 70, the lode shows signs of improvement, being valued at 1 ton per fathom. The lode in Martinez winze, sinking below the 90, is regular and moderately productive, at 1 ton of ore per fathom. The lode in Muna's winze, sinking below the 70, is small and disarranged.—Los Salidos Mine: In the 175, driving west of Taylor's engine-shaft, we have not yet reached the lode on the western side of the cross-course. In the same level, driving east of Taylor's engine-shaft, a valuable piece of ore ground is being opened up, worth 2 tons per fathom. The lode in the 160, driving east of Taylor's engine-shaft, is unprodective, and the granite very broken and unsettled. In the 145, driving east of Taylor's engine-shaft, the lode is getting a little better formed than it was. The lode in the 130, driving east of Taylor's engine-shaft, has further improved to 2 tons per fathom. In the 120, driving east of San Pablo's shaft, the lode continues productive and very regular, being worth 1½ ton of ore per fathom. The 80, driving west of Palgrave's shaft, is holed to Pepe's winze, and the driving is temporarily suspended. Soto's winze, sinking below the 110, is down to the 120; the lode is worth 1½ ton per fathom. In Blas winze, sinking below the 35, the lode is open and strong, yielding good stones of ore, valued at ¾ ton per fathom. The weekly weighings of ore were continued very steadily during the past month, and the stopes are turning out moderately at present. The works at surface are going on regularly, and the machinery is in good working order. We estimate the raising for April at 350 tons.—San Anton Mine: In the 45 driving, east of Henty's engine-shaft, the lode (worth ¾ ton per fathom) is disarranged, and getting into very unsettled ground. The lode in the 55, driving west of Castro's winze, has fallen off in value to 1 ton per fathom. In the 55, driving east of Henty's engine-shaft, the lode is unproductive at present. There is no improvement in the 55, driving west of Henty's engine-shaft. The lode in the 45, driving in the same direction, yields occasional stones of ore. In the 30, driving west of Henty's engine-shaft, we expect a speedy improvement. there being a good lode in the new winze in advance of it. Lorentes winze, sinking below old level, is situate west of Henty's engine-shaft and in advance of the 30 fm. level.—San Francisco Mine: The 25, driving east of engine-shaft, is in a strong cross-course. In the 40, driving east of engine-shaft, the lode is unsettled and the ground very much broken. The lode in the 50, driving in the same direction, is regular, producing ½ ton per fathom, and the granite less decomposed than in the upper level. In the 50, driving west of engine-shaft, the ground is very soft and easy for opening up; lode changeable, producing ½ ton per fathom. The lode in the 40, driving west of engine-shaft, is irregular, and at present without ore. On Moreno's winze, sinking below the 25, the granite is decomposed and inexpensive for working, the lode being worth ½ ton per fathom. It will be put through to the 40 in the present month. The weekly returns of ore were kept up very regularly during the past month, and the stopes have not undergone any change worthy of notice. The surface works are going on steadily, and the machinery is in good condition. We estimate the raisings for April (five weeks) at 100 tons.

ALAMILLOS.—April 12: The 20 driving east of Santa Agueda shaft has reached the point to communicate with San Martin cross-cut, and the men are put to drive west of San Martin shaft. The lode in the 60, driving east of San Felipe's shaft, has decreased in size and value to ½ ton per fathom. In the 40, driving west of San Felipe's shaft, the lode has improved to ¾ ton per fathom. The lode in the 40, driving east of Eusebio's winze, produces stones of ore valued at ½ ton per fathom. The 60, driving east of San Enrique's shaft, continues in a good lode, which is easy for working, being worth 2 tons per fathom. The lode in the 130, driving east of Taylor's engine-shaft, is more open, and has a kindly appearance, producing 1 ton per fathom. In the 130, driving west of Taylor's engine-shaft, the lode is regular, but it does not contain lead. In the 80, driving east of San Victor shaft, there is a large fissure in the lode, which increased the speed of driving; the value of the lode is 1½ ton per fathom. In the 50, driving in the same direction. The lode is unproductive, and the granite is hard for driving through. There is no alteration in the 80 (middle lode), driving west of San Victor shaft, the lode being still valued at ½ ton per fathom. In the 80, driving west of San Victor shaft, the men are driving south to prove if the main part of the lode is in that direction. The lode in the 50, driving west of San Victor shaft, is unproductive, and the granite is hard for working. In the 70, driving in the same direction, the lode is small and poor. No improvement has taken place in Diaz winze sinking below the 70. The lode in Almanza's winze, sinking below the 60, is producing good stones of ore, worth ¾ per fathom

BUENA VENTURA.—April 12: In the 22 driving east of Henty's engine shaft the lode is very open and of a promising appearance. The lode in the same level driving west of Henty's engine shaft is small and poor. Good progress is being made in the 50 driving west of Cox'e engine shaft, but the lode continues unproductive. In the 20 driving east of Taylor's engine shaft the lode is small, consisting of carbonate of lime and lead ore, valued at ½ ton per fathom. The lode in the 30 driving east of Taylor's engine shaft is very regular, containing a little ore, but nothing to value. In Taylor's engine shaft sinking below the 30, the lode is worth 1½ ton per fathom, and the ground is hard for sinking. The sinking of Henty's engine shaft below the 22 is suspended for a few days, in consequence of the pitman fixing a plunging lift.

CANADIAN COPPER AND SULPHUR.—Francis Bennetts, April 6: You will be pleased to hear that the 70, east of Hartford No. 5 shaft, has improved, the vein in the bottom of the drift being all the size of the drift—that is, about 5 ft. wide. I am glad to inform you that there is a vein in the 40 and the 75 east of about 5 ft. wide, yielding ores of from 4 per cent. to 5 per cent. The vein in the stopes maintains its average size and productiveness. The Capelton Smelting Works are running well.

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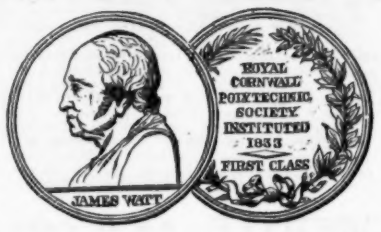

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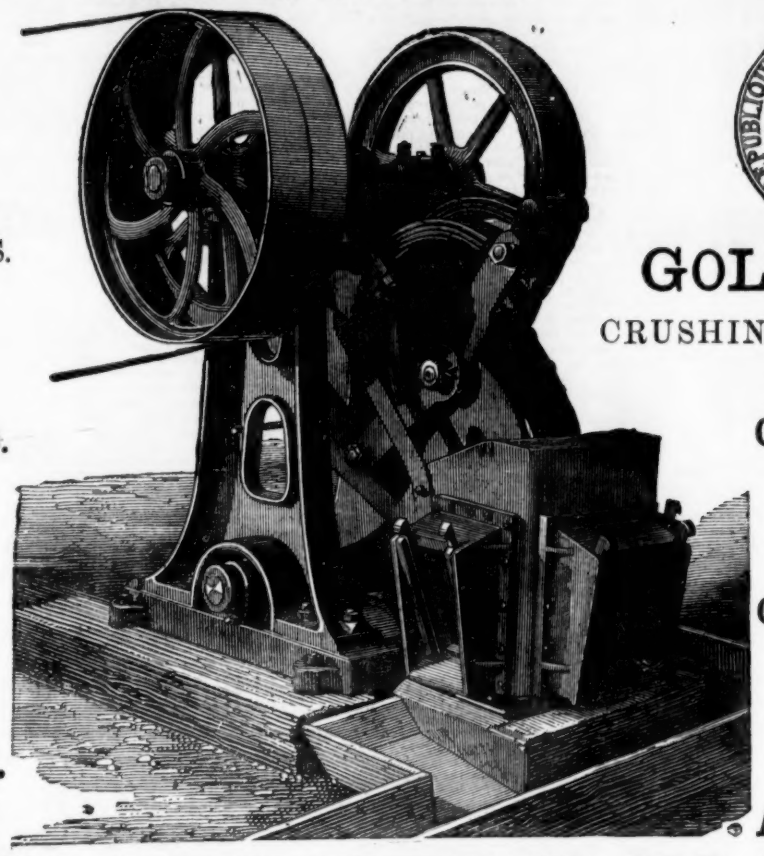

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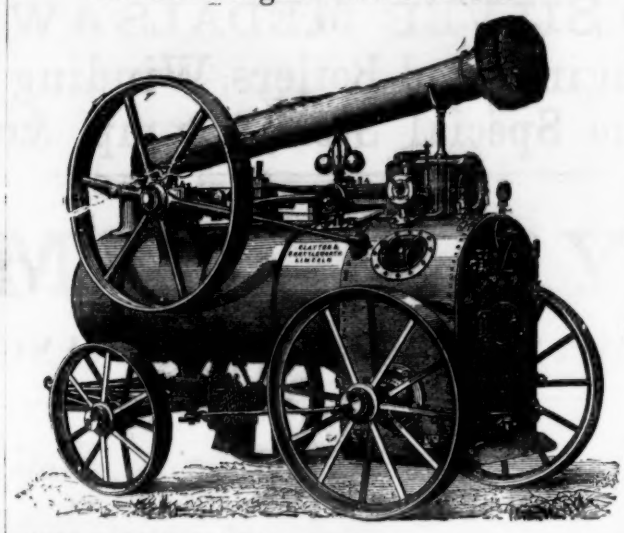

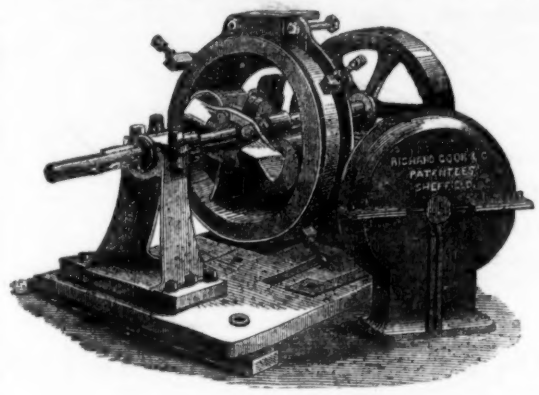

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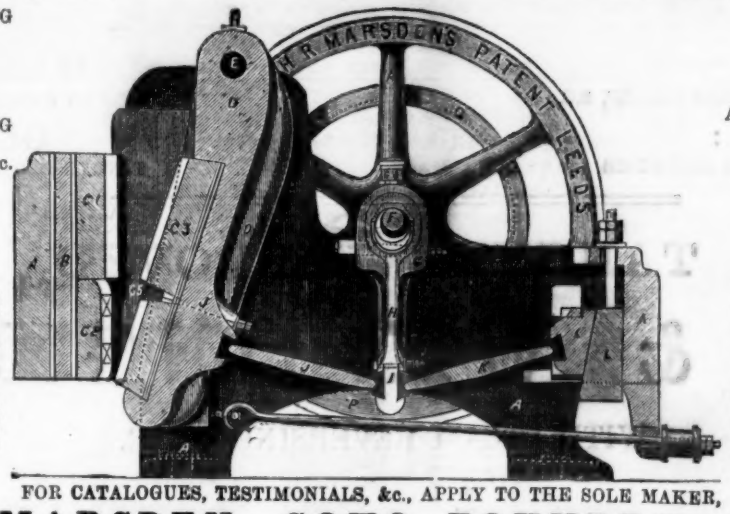

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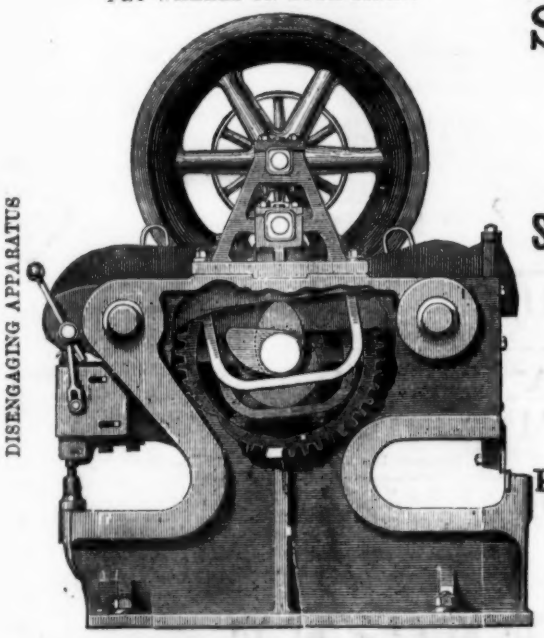

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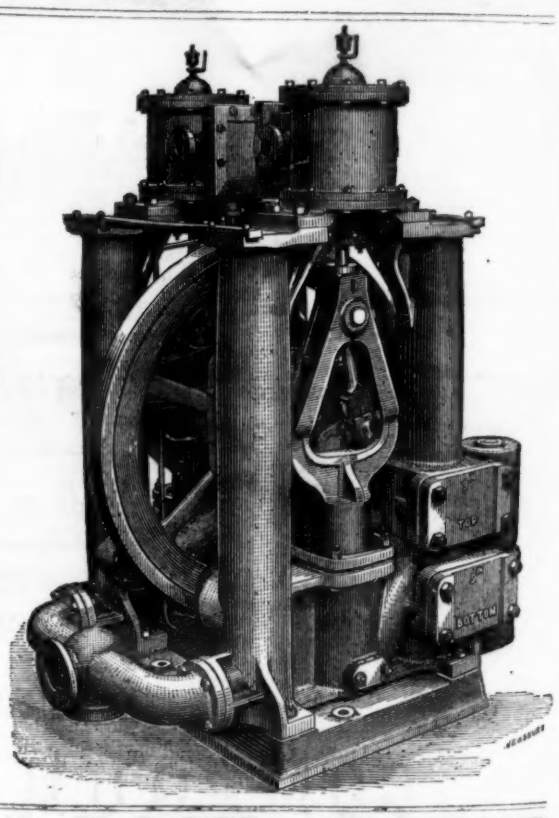

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